THE ENGINEERING AND MINING JOURNAL.

VOL. XII.—NO. 5.—FOURTH SERIES.] NEW YORK, TUESDAY, AUGUST 1, 1871. [SINGLE COPIES 10 CENTS.

Process for Roasting Gold and Silver Ores.

VIRGINIA CITY, Nevada, July 5, 1871.

TO THE EDITOR. Sir: In Mr. RAYMOND'S Report, 1870, page 356, he says of the Keith Furnace: "The cardinal defect was in trying to desulphurize in a reducing flame, and in the time—one second."

1. Is there any more reducing flame or effect in the Keith than in the Stetefeldt Furnace, chloridizing or desulphurizing like the Reno Furnace; that is using wood, and like Keith's—completing the operation in a second or two?

2. If so,—why?

3. Is there any possibility of desulphurizing or chloridizing in an upright shaft, with the proper condensing chambers, feeding the pulp with a blower, and thereby furnishing also the required draft?

A LEARNER.

REPLY.

1. We cannot do better than to recommend to our correspondent a more extended perusal of the report to which he refers. He will find on pgs. 749-755 a full description of the Stetefeldt furnace together with a full explanation of the chemical reactions which take place in the furnace.

Of course Mr. STETEFELDT cannot accomplish an oxidation of sulphur, and its removal as sulphurous acid, except by the presence of oxygen in the furnace. He never attempted to do it. Mr. KEITH, it appears, did make the attempt and failed.

The difference between an oxidizing and a reducing flame is simply that the former contains an excess of oxygen which it is ready to yield to substances, which, at the prevailing temperature, have sufficient affinity for it. In order to oxidize the sulphur contained in pyrites a good supply of free oxygen at a high temperature is requisite; this Mr. KEITH, probably through some defect in his apparatus, did not obtain. If he had used salt and supplied a sufficient amount of oxygen to his flame he would doubtless have obtained different results. Our correspondent must remember also that the STETEFELDT furnace is used for *silver* ores, and that the roasting is at the same time a chloridation. Mr. KEITH'S experiments were made with *gold* ores, and without the use of salt.

If gold ore mixed with salt were to be passed through the furnace at Reno, there is some doubt as to what the result would be. The chloride of gold is decomposed at a comparatively low temperature, so that it is exceedingly doubtful whether it would be formed at all. If it were formed and again decomposed the gold would probably be left in a good condition for amalgamation.

It has been suggested that the chloridation of the base metals might be accomplished and the gold simply freed from the pyrites and rendered easy of amalgamation. If this were possible, the copper, for example, could be lixiviated as chloride and saved. The heat, however, would probably decompose the base metal chlorides, as well as the gold chloride, and nothing would be gained.

Still it appears probable that salt might play a very important *rôle* in the desulphurization of gold ores by merely shortening the time necessary to complete the operation. The sulphuric acid of the sulphates formed in roasting would decompose the salt and unite with the soda—the heat being so high that the chlorine would not unite with either gold or copper. The salt in that case would only serve as an agent for the decomposition of the sulphates formed in the roasting, and to accomplish this purpose perhaps some better and cheaper agent might be found. If a piece of pure, bright gold be allowed to remain in a heated muffle for a few minutes, near a piece of pyrites, it will, on removal, be found apparently unchanged, but inert with reference to quicksilver. Now, if we immerse the piece of gold for a short time in hydrochloric acid and again bring it in contact with quicksilver, amalgamation will commence at once, showing that something has been removed by the acid. It has been suggested, in conformity with such observations, that the main object in roasting gold ores is to free the small particles of the metal from a coating which prevents their contact with quicksilver. A simple roasting does not accomplish the removal of this coating, but only its conversion into an oxide, which is still sufficiently strong and thick to prevent many of the particles coming in contact with the quicksilver. It is claimed that what is really wanted, to obtain good results in amalgamating roasted pyrites, is a cheap means of removing this coating of iron oxide. At a red heat, chlorine unites with iron and forms an exceedingly volatile chloride, which would pass out of the furnace with the products of combustion. It is considered probable, by many of our best metallurgists, that the chlorine set free from the salt would combine with the fine films of iron rust covering the gold, and the chloride becoming volatilized by the heat, the gold would be left bright and in an excellent condition for amalgamation. A few months' practical working would prove more than all the theorizing in the world, but the owners of the furnace have never had sufficient confidence in its adaptability for gold ores to be at the expense of a trial.

2. The reason for the superior oxidizing power of the Stetefeldt furnace is that proportionally more oxygen is admitted to the flame.

3. We do not doubt the possibility of constructing a furnace so that the finely divided ore could be blown in by a current of air from a blower. We fail to see, however, that this plan would possess any advantage over the method now employed at Reno, viz.: sifting the pulp in at the top of the furnace and using a natural draft instead of an artificial one. The easy, cheap and effective manner in which the Stetefeldt furnace is fed constitutes one of its chief merits.

ED.

An International Association of Mining Engineers and Metallurgists.

FROM accounts of the recent meeting of the German Association of Engineers, in Dresden, we learn that they seriously consider the project of establishing an international congress of mining engineers and metallurgists. They intend to include in their invitation engineers from all parts of the world, and to prepare for exhibition a collection of ores and smelting products of special interest. Dresden is named as the most suitable place for meeting, on account of its proximity to some of the most extensive mines and smelting works in the world, to which excursions could easily be made.

Considering how far we are away from the place of meeting, the idea may seem somewhat impracticable, and, of course, they cannot secure the presence of a large proportion of the engineers scattered over the world at any one meeting; but the advantages of belonging to such an institution would induce many to join who could only occasionally attend an annual meeting. We advocate the interchange of ideas among engineers as one of the very best methods of raising the standard of professional acquirements, and in no other way can this end be so easily accomplished as by meetings for the discussion of subjects of professional interest, and the personal examination of the practice of different sections and countries. The medical profession has long recognized the value of such meetings, though we are not aware that they have ever held an international congress. The American Institute of Mining Engineers and the various associations of engineers throughout the country bear witness that engineers are not behind hand in their support of local associations; and, though the membership of an international congress would be somewhat more expensive, the benefits ought to be correspondingly greater.

We heartily wish for the success of the proposed association.

Misplaced Switches.

THE recent serious and fatal accident on the New York and Newark Railroad, by which a train was thrown from its track in the path of a train coming in the opposite direction, by the misplacement of a switch, is the latest melancholy addition to an already long list of casualties of a similar nature, resulting, as in this instance, from causes which might have been averted by the adoption of simple precautions against them. No one will deny that persons entrusted with the responsible duty of managing railroad switches, should so discharge their duties that no accident should occur through carelessness or neglect on their part, but it is scarcely worth while to look for perfect fidelity on all occasions from the irresponsible servants of any corporation, and as no man is infallible, every one, however faithful, may at times make mistakes most disastrous and fatal in their consequences. In the recent casualty on the Newark road, the responsibility for the loss of life rests quite as much with the company as with the delinquent switch-tender, inasmuch as no precautions had been taken to provide against the consequences of a possible neglect of duty by the boy on whom the work of shifting the switches devolved. The immediate scene of the accident in question was the junction of a side track, only used by travel trains engaged in hauling material for the construction of a branch line, with the main track of the New York and Newark road. This side track is seldom used. On the morning of the accident, however, it was opened to pass a train into the gravel pits, and the switch-tender neglected to close the switch, thus leaving the main track open. This should not have been possible. The switch at this

point should have been so constructed as to close itself automatically when not held open. Had such a switch been provided, the terrible accident with its attendant loss of life and destruction of property would not have occurred.

We commend this matter to the immediate and serious consideration of the responsible managers of every American railroad. The system of self-closing switches is now in general use in England, and in some parts of the Continent of Europe, and the introduction of this great improvement has already been attended with the best results in diminishing the risks of travel by rail. Under this improved system, all switches communicating with side tracks or turn-outs close automatically—remaining open only so long as they are held so by the switch-tenders. This insures a degree of safety which can never be attained so long as the proper management of switches is dependent solely upon the intelligence and fidelity of the employees, who may lack the requisite experience, and who are liable at any time to make mistakes, or to neglect duty. It is one of the first conditions of safety in railroad management that the railroad track always remain closed, except when temporarily opened for a specific purpose, and to secure this, all switches should, as we have said, be so constructed as to close themselves the moment they are left alone. This simple precaution would prevent many of the accidents which are now liable to occur at any time through the carelessness or neglect of irresponsible, intemperate or inexperienced switch-tenders, and greatly diminish the present great risk attending railway travel in most sections of this country.—*The Iron Age.*

Bessemer on Patent Law.

ON Thursday, the 29th ult., before the House of Commons Committee on Patent Law, Mr. HENRY BESSEMER gave the following very interesting evidence:

He said that about seventeen years ago his attention was drawn to the desirability of making improvements in the manufacture of iron; for eighteen months he worked unsuccessfully in the endeavor to make improvements, and then the idea struck him that it might be possible to make cast iron malleable by introducing air into the fluid metal. He accordingly made experiments, which proved to him that the highest temperature ever known in the arts could be obtained by the introduction of air into molten cast iron; these additional experiments occupied five more months of his time. In carrying out all these experiments, his attention was diverted from his own pursuits for two or two-and-a-half years, and his expenses over the work amounted to six or seven thousand pounds. Mr. GEORGE RENNIE came to see his experimental works in London, and was so struck by what he saw, that he recommended him to bring the invention before the public immediately. He said that whatever the deficiencies of the invention might be in detail, directly the practical ironmaster saw the plan, he would fill in the details. He (Mr. BESSEMER) accordingly read his paper on the subject at the British Association four days later, the result being that great interest was excited, and several ironmasters visited him in London. He then acted upon the following plan:

He divided England into five districts, and he said he wished one ironmaster in each district to work with him, and not against him. On condition that the ironmaster agreed to do so, the said ironmaster was to pay him a royalty during the first year, but no other royalty during the fourteen years of the protection by patent. Hence each of these five would be very strongly interested in the maintenance of his patent. His proposition was accepted, and within a very few weeks after the reading of his paper, licenses were taken out amounting to £30,000. The writers in the press did not believe that he could melt malleable iron rapidly, and as several of the ironmasters who carried out his plans faithfully were unsuccessful in their attempts to manufacture, everybody began to run him down. He found that there was a difficulty, so set to work with the capital he had acquired to overcome the difficulty. His experiments were not small ones on the laboratory scale, for he worked from half a ton to two-and-a-half tons of metal at a time, and in working thus for two-and-a-half years, spent about £16,000. Then he succeeded in overcoming the difficulty, also how to make steel as well as malleable iron; the steel was of so good a quality that in the workshops it could not be distinguished from high-class Sheffield metal. He announced these results, but in the press everybody ran the invention down, and nobody believed in it. Had he not been supported by capital, his experiments would never have been carried out, and no one of the five ironmasters who allied themselves with him at first made any attempt to get over the first difficulties; they looked upon him simply as a meteor in the metallurgical world. After he perfected the invention, neither ironmasters nor steelmakers would take it up. When the case seemed hopeless, he joined two gentlemen at Manchester, and between them they erected works at Sheffield, to show the people that the invention was a reality. When they first began to sell they had orders for 28 or 56 pounds of steel at a time, but soon the demand began to grow larger, and then the manufacturers began to find that they were being undersold at £20 per ton. Sir JOHN BROWN was then erecting great works at Sheffield for the manufacture of steel. He came to see the new process at work, then altered all his plans, and took out licenses to work the process on payment of a royalty of £2 per ton. When he came before the public with his first invention, he had asked a royalty only of $2 per ton. The effect upon the iron trade of his invention was that railway tires, which once cost £90 per ton, now cost but £20 per ton, and steel of all kinds and for all purposes had been very greatly reduced in price; therefore he thought that a royalty of £2 per ton was not too much. In this way the business progressed, and he had not only introduced this method of making steel into this country, but it was extensively worked on the Continent, in America, and in India. If there had been no patent law to fall back upon, he could not have given the time and work to the invention which was found to be necessary, and when the first failure took place, all the world was against him. The general results of the invention were that steel had been reduced from £50 or £60 per ton to £20. Without the patent law, he, as an engineer, should not have gone into the iron trade, with which trade he was originally in no way connected, but with the protection of the patent law he felt no hesitation in making experiments; and when he recouped himself with £30,000, in spite of the adverse opinions of the trade, he still further perfected the invention. He had taken out twenty-six patents in all. The great invention was the forcing of atmospheric air in an upward direction through molten iron. That invention would have been practically valueless, without the after patents relating to improvements in machinery, to get the first man to try the practical value of an invention.

After he completed his invention, he paid the five ironmasters with whom he made his first agreements to cancel them; to one of them he paid $10,000, and to the Dowlais Company he paid £20,000. By these means he swept the market of all special privileges. Some of these manufacturers could have gained £40,000 a year had they kept the original privileges. Seven years ago M. SCHNEIDER came over from France to him for a license to use the process. He furnished him with drawings and information; but, after the lapse of two years, he did nothing. At the end of that time he asked to be supplied with additional plans on a great scale. Accordingly, he sent M. SCHNEIDER an entire set of new plans, with all the recent improvements; thirteen large sheets of drawings were executed for him. He charged a fixed price per ton on all iron made, as he had said, but nothing for plans. M. SCHNEIDER then sent his foreman to his (Mr. BESSEMER'S) works; the foreman also inspected several other works. Time passed away, still M. SCHNEIDER did not put up his works. About fourteen months before the chief French patent expired, M. SCHNEIDER finished some large works made from his plans, and did not use them; but the day after the patent expired, he set enormous works to work. On another patent for machinery he charged M. SCHNEIDER a royalty of 2s. 6d. per ton, and an action at law about the payment of that royalty is now pending. He had consequently not received a farthing from France, as all the other manufacturers were following suit, and waiting to see the result of the suit. He (Mr. BESSEMER) charged the same royalty in foreign countries to those who worked his foreign patents, and he had taken out patents in France, Belgium, Sweden, Austria, and the United States, in all of which countries he charged a royalty of £2 per ton. He did not take one out in Prussia.

He sent his papers to Prussia in the care of Mr. KRUPP, who paid him £5,000 for the use of his patents. He applied in due course for a patent, and was informed by the Prussian Patent-office that the invention was not new. The Prussian Patent-office grants occasional patents; they take the fees and the drawings from British inventors in any case, and afterwards publish them for the benefit of Prussia. The office said that Mr. NASMYTH was the inventor of the process; Mr. NASMYTH said that he was not. They next said that they would give the name of the real man in a few days. Six weeks passed, and they said, "If we don't find the name of the real man to-morrow we will give you the patent." A week of these "to-morrows" passed, after which they showed an English blue-book with his own invention published in it, and they said, "Your invention is published, so according to the law of Prussia we cannot grant you a patent." All the time they had been promising to grant it. The process is now worked very largely in Prussia. He thought that it was a custom at Berlin to hold out the prospect of granting a patent to get all the information they can from the English inventor, and then they tell him that his invention is not new. Mr. KRUPP has taken out an immense number of patents. He (Mr. BESSEMER) believed that he received the full amount of his royalties from continental manufacturers; he had one agent there only, and he lived in Paris; he had never kept more than two clerks, and these, with himself and partner, did all the work of attending to his business in connection with the manufacture or steel and iron. The patentee has the power by English law of stopping the importation of articles made without his consent by persons using his invention in foreign countries. Large as the royalty of £2 might seem to be, it does not interfere with the manufacture or with commercial arrangements at all. The steel which he sold at £15 per ton was the same, so far as he could see, as that which Mr. KRUPP sold at £130 per ton; he had tested the two by bending, specific gravity, and everything else, and could find no difference between them. Mr. KRUPP was one of the greatest manufacturers of Bessemer steel. He did not think any commission would have awarded him £5 for his original idea, or would have given him half a million of money as a reward for his invention. Unsuccessful inventors are an unfortunate class, unfitted to struggle with the world in any business whatever, and they ought to have been born with money, instead of talent only. He did not think that, as a whole, the losses of inventors were greater than their profits. In England also we get a great many foreign patents we should hear nothing about for several years, were it not for the security given by the patent law to inventors. Competition in business does not foster invention much, more especially when the expenditure of large sums of money in experiments is involved.

Bessemer Steel Horse Shoes.

HORSE shoes are now made in England of Bessemer steel. They are lighter and tougher than iron shoes but not more expensive.

Smelting Processes at Freiberg.*

By PERSIFOR FRAZER, JR.

THE PATTINSON PROCESS, OR THE CONCENTRATION OF SILVER IN THE RAW LEAD.

THIS process was invented in the year 1833, by Mr. PATTINSON, of Northumberland, originally with the design of desilverizing leads so poor in silver that they could not be economically cupelled. More recently, this process has also been applied with advantage to leads rich in silver. The plan is to make a lead richer in silver, which diminishes, firstly, the volume of lead to be subject to cupellation; and secondly, the loss of lead. The plain explanation of the principle underlying this process is as follows:

A lead containing some silver is melted up in one of a row of large iron kettles, capable of containing from 200 to 250 centners (20,000 pounds, or ten tons), and then allowed slowly to cool, the fire being withdrawn. While the molten lead is slowly cooling, it is carefully stirred by means of a large perforated iron ladle. In cooling, numbers of crystals are continually being formed and deposited in the bottom, the mother-liquor, or that part which remains molten, containing more silver than that which crystallizes out. The ladle is run down the sides, and scraped over the bottom of the kettle, and then drawn up slowly, and struck once or twice to permit the mother-liquor to run out through the perforations. The crystals are then transferred to the next kettle to the right hand. The consequence is, that at one end of the battery or row of kettles, almost pure lead is obtained, while at the other the required richness, 1.4 to 1.5 per cent. is reached.

The purity of the lead has especial influence on the working of the process itself, so that the lead which is subjected to Pattinsoning must first be refined, in order to remove the arsenic, antimony and sulphur which it contains.

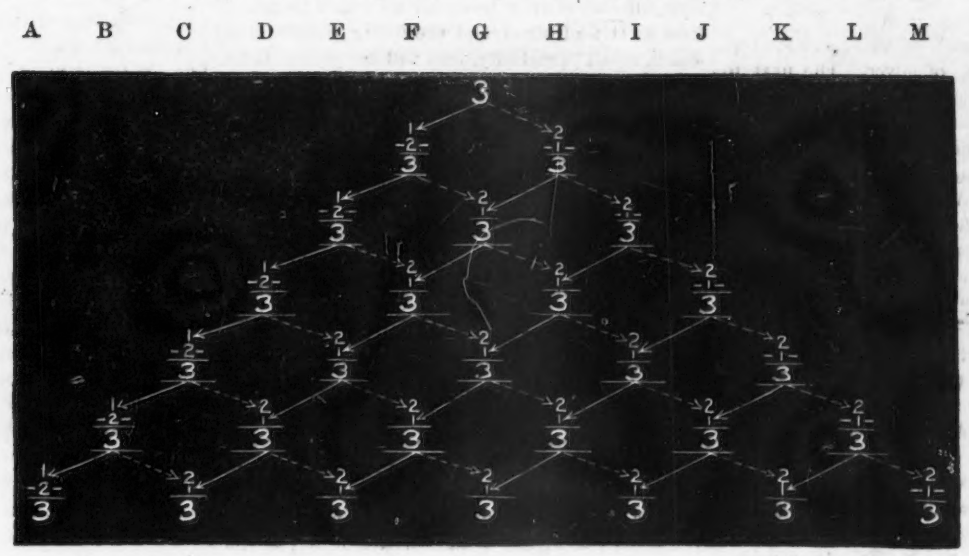
The latter substance especially must be guarded against, as it not only interferes with the proper course of the work, but destroys the kettle itself, as a refining experiment with one of these kettles in Freiberg, and the fate of a whole battery of them, under the charge of an incompetent man in the West, abundantly prove.

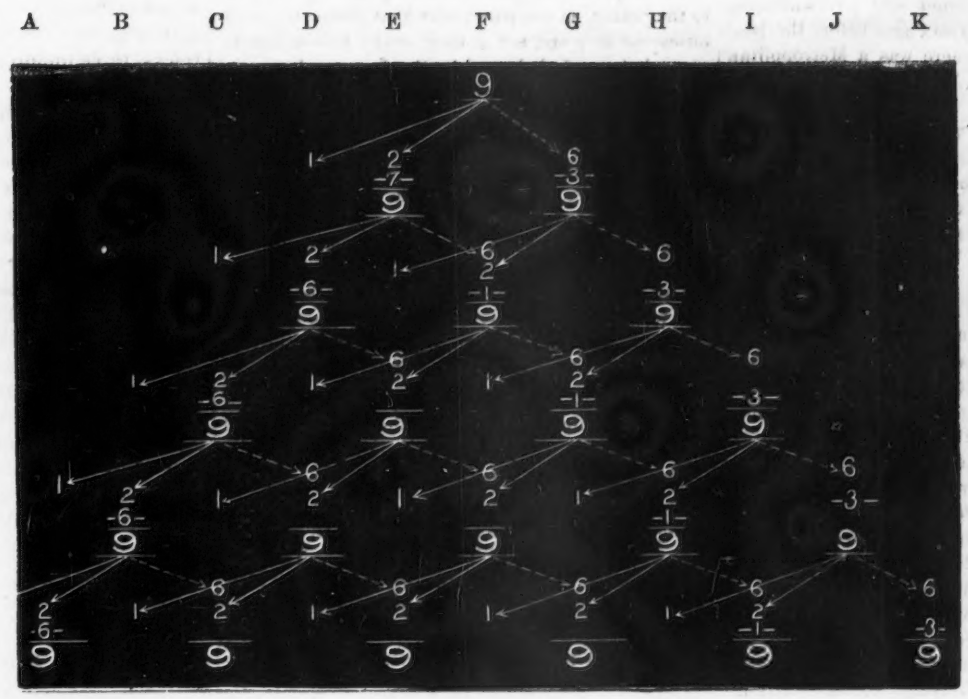
The point to which it is possible to carry the separation by this method is about 2¼ per cent. of silver, according to experiments conducted at these works. Here the formation of crystals becomes slower and slower, and the still molten mass shows an unmistakable tendency to congeal and harden into a perfectly homogeneous mass. The explanation of this is, that up to this percentage the melting point of the alloy is lower, but above this it is higher than that of lead. Certain it is, that the melting point of an alloy of equal parts silver and lead (or even three parts of lead and one part of silver) is higher than that of pure lead.

The process can be undertaken either with or without intermediate crystals.

1. THE TWO-THIRD SYSTEM WITHOUT INTERMEDIATE CRYSTALS.

The following is the manipulation of the two-third system without intermediate crystals:





After the lead in the kettle has been melted, and the scum forming on the top (copper, arsenic and lead) has been removed, the fire is almost entirely raked away, and the fire-door under the kettle opened. Water is then carefully sprinkled on the surface of the molten lead bath. This causes the lead near the edge of the kettle to solidify. These solid lumps are broken off, and stirred into the rest of the lead, by which means the temperature of the whole mass is evenly lowered. When this lowering of temperature has reached a certain point, the mass becomes viscous from the beginning of the formation of crystals (which are small octahedra). Two workmen now grasp the ladle, and sink it into the kettle, along the sides and bottom, over which it is scraped to collect the crystals deposited there. It is then raised by making a fulcrum of the rim of the kettle. Here it gets two good shakes, to force out the liquid contents of the ladle through the holes. The ladle and its contents are then slid over to the next kettle to the right, on a movable traveller, and the crystals are turned into it. This kettle has been already heated, so that they melt immediately on being placed in it. When two-thirds of the original contents of the kettle have been transferred to the kettle to the right, the remainder is ladled in a liquid state into the kettle to the left. This latter one-third is compared to the original mass in the first kettle, rich in silver, and the two-thirds which have gone in solid crystals to the right comparatively poor; these two are now treated in the same way, the two-thirds crystals from the kettle on the left being ladled into the middle kettle in which the operation began, into which comes also the one-third mother-liquid from the kettle on the right, while one-third still richer mother-liquid goes into the next kettle to the left, and two-thirds still poorer lead crystals go to the kettle still further to the right. Soon the whole battery is in operation, the alternate kettles, at the close of any one operation, being empty, and the same kettles, at the close of the next step, full. In order to fill up the kettles into which respectively one-third and two-thirds of a charge have been put, refined lead, of various percentages of silver, is stamped, assayed and distributed to the different kettles of the battery, so that lead of the required percentage is always on hand to fill up any kettle. In order to comprehend this more clearly, let us suppose the battery to consist of the kettles A B C D E — and let 3 = capacity of each kettle.

Assume that lead of a known percentage of silver is introduced into the middle kettle of the battery (G). Then 2 of crystals go to H, and 1 of mother liquor to F. Each of these is filled with lead of a richness corresponding to that of its contents, and the process is continued by allowing F and H to crystallize, whereby 2 from F are transferred to the now empty kettle G, and 1 to E. From H, 2 are carried to I, and 1 to G, which is just filled from the two kettles next to it. This is continued, the number of kettles increasing until lead of the required silver-percentage in one end, and of the necessary purity at the other, is obtained. In the above diagram the numbers between two dashes represent thirds of lead which have to be added from lead at hand to fill a kettle, but are not transferred from any other kettle. The ⅓ of a kettle which are carried as crystals to the right, are in-

* Read before the American Philosophical Society, June 17,

dicated by dotted lines ending in arrow heads; the full lines ending in arrow heads lead to the one thirds, or the rich mother-liquor.

2. TWO-THIRDS SYSTEM WITH INTERMEDIATE CRYSTALS.

By this system ⅔ of the contents of the first kettle are transferred to the neighboring kettle to the right, as before, in the form of crystals, but after this is done the remaining mother-liquor is treated in the same way; the first two-thirds of the one original third (2-9) being transferred as crystals to the first kettle to the left, and the remainder (1-9) being ladled, as the mother-liquor, into the second kettle to the left, as shown in the diagram.

It will be observed that each of these kettles represents a certain percentage of silver. The next to the last kettle on the "rich lead" side is crystallized, without intermediate crystals. During the process, a button is obtained from each kettle, for analysis, in order to ascertain exactly how the concentration is proceeding. At every kettle there are employed two workmen, who complete two crystallizations. One fireman attends to firing the furnaces of the battery, under direction of the foreman.

[To be continued.]

London Street Tramways.

THE projectors of horse tramways for the Metropolitan streets are just now carrying matters entirely to their own satisfaction. Authority outside and inside the Committee rooms of the House sides with them. The Board of Works and the Board of Trade have declared themselves almost unreservedly for the construction of a system of iron ways for the convenience of passenger street traffic. Opposition in Committee is but of small avail, capitalists are willing, nay, anxious to speculate in these new routes, which have just now become the rage, but which have until recently, met with overwhelming opposition. Just as a few years ago, before the professional collapse of 1866, there was a Metropolitan railway epidemic, so now there is a Metropolitan tramway epidemic. The probable consequences will be that before long we shall see some hundreds of miles of line laid down in the streets and roads of London, to the convenience of a section of the travelling public, to the inconvenience of a large portion of the community, and to the ultimate dismay and loss of investors. We admit, as we always have admitted, that street cars are far more commodious and more pleasant to travel in than omnibuses are; foreign experience—that is, American experience—shows that they are eminently successful for the main objects for which they are constructed, and that—conditions being favorable—street tramways are indispensable for the convenience of street traffic. Had we followed the common-sense practice of the Americans, the tramway system in the metropolis would years ago have passed the stage of experiment, and we should now be following out the question of metropolitan railways; but unfortunately the latter were established first at an enormous outlay, and now tramways follow, when they ought to have led. The railways cannot be considered as successful; they are in their way triumphs of engineering art; they give travelling accommodation to millions; they have helped those who conceived and constructed them to colossal reputations and princely fortunes; but shareholders for the most part shake their heads, and begin to show anxiety about their prospects, now that in all probability the tramway companies will step in to divide or absorb the meagre dividends.

As we say, the promoters of these new schemes seem to carry all before them in committee. The dissentient voice of the public is fitfully heard through the medium of the daily press. Frightened shopkeepers, threatened already by the growth of co-operation, hold up their heads in dismay, and predictions of evil resound on all sides as to the probable effect upon the general traffic of the streets. Of course, these anticipated evils are greatly exaggerated, and possibly those who already complain of broken wheels and injured horses, have somewhat colored their grievances. But in the main there is much reason for fearing that the present lavish sanction of street tramways in London will be productive of great evil. In discussing this question some time since, we pointed out that, apart from commercial considerations, suburban tramways must be eminently successful. The roads leading out of London are, for the most part, broad, the general wheeled traffic light, and whatever slight inconvenience may be created, will only be the inconvenience of the few, for the benefit of the majority. It is a very different matter, however, with such thoroughfares as Oxford street and those city streets, along which, in all probability, cars will be plying before long. In Oxford street, for example, the shopkeepers will doubtless suffer greatly. At present there is but just room, even with careful management, for the traffic in the busy hours of the day. What, then, will be the effect of allotting the best part of the road to vehicles to which everything else on wheels must give place? The cars will doubtless defeat the omnibuses in the severe competition that would ensue; they will also, in a great measure, drive out of the street the lines of carriages which at present congregate there to the benefit of the shopkeepers, and the owners of which, sooner than incur the inconveniences and risks arising from the tramway, will seek other shops located in streets undisturbed by the rails. Of the inconveniences to generel carriage traffic, we gather from letters received by ourselves, and from others appearing in the *Times*, that the form of rail now laid down is productive of annoying and even serious accidents, a small matter, it may be, on roads where carriages are few in number, but all-important where they form the larger proportion of the traffic.

The superior accommodation offered by the cars to the public, as compared with that given by omnibuses—as they are, not as they might be—would be somewhat counterbalanced by the inconveniences to passengers on entering and quitting them. At present, omnibuses, free to go as they will, draw up alongside the curb, or, at all events, close to it, to receive and discharge their freight, but tramway cars cannot do this, and passengers have to cross from the footpath to the centre of the road to enter the vehicle. In a crowded thoroughfare, especially in wet weather, this operation is always disagreeable, and often dangerous for women and infirm people. The Westminster Bridge terminus of the Brixton and Clapham Tramways afforded a good illustration of this during last winter, but the inconveniences there are small compared to those which will exist at different points on some of the lines that will probably be laid.

Taking all things into consideration, we cannot avoid sharing the opinion of the alarmists, and believing that the legislature is committing an error in such a free sanction of Tramway Bills. There is but a small prospect that the executed work will prove remunerative; in the streets they must prove obstructive, and though they give comfort to passengers, speed in busy thoroughfares will be unattainable; the advantages they will confer will be greatly out of proportion to the disadvantages they involve. The London streets, laid out on no system, and having, for the most part, inconsiderable width, can at present scarcely accommodate the traffic thrown upon them, much less can they afford to part with any of their space.

What is really required for the improvement of the metropolitan traffic, are tramways for suburban roads, asphalte, or its equivalent, for crowded streets; with steam-rolled macadam roads where asphalte is not used; upon these two latter should run omnibuses, commodious and spacious, and traffic regulations should be improved, and properly enforced.

If these reforms were carried out, the cost per mile of such street improvements would not much exceed the outlay per mile for tramways, a universal benefit would be conferred, and investors in many future tramway schemes would be spared the mortification of finding at no very remote period that they had committed a mistake.—*Engineering*.

The Viaduct Railway.

AT a meeting of the Executive Committee of the New York Railway Company, held on Monday, July 24, 1871, the President presented a report, which was accepted and adopted by the committee, from which we extract the following:

The cost of real estate to be acquired, the cost of construction and running expenses, contrasted with the receipts for rent and passenger and freight traffic, are the elements which must determine the probable profits on capital invested.

The cost of necessary real estate for viaducts and depots is estimated at one million of dollars per mile, or say for eighty lots, with buildings, at an average cost of twelve thousand five hundred dollars each.

The construction of the viaduct, including rails and permanent road-bed and running stock, will cost two millions of dollars per mile.

The distance from the City Hall to the Harlem river at One Hundred and Thirtieth street, or to Manhattanville, being seven and a half miles, would make the cost of each branch of the road twenty-two and a half millions of dollars, and with an allowance of two and a half millions of dollars for unforeseen contingencies, would make the entire cost of each branch of the road twenty-five millions of dollars.

It is proposed that each branch road shall have four tracks, two for fast travel, making stoppages at about two miles apart, and two for way travel, making stops at about each half mile. Twenty trains per hour can be safely run upon each track, each train to average three hundred fares or passengers, which would make the number of passengers that could be carried in fourteen hours of the day, upon the four tracks, three hundred and thirty-six thousand (336,000). But it must be remembered that during three hours of each morning and evening the travel on the road will be greater than during the remainder of the day, and that as soon as the road is found not competent to accommodate the travel offered during the morning and evening hours, other roads must be built to accommodate the surplus. Hence it is that that the projected roads will not at any time have the opportunity to carry as many passengers as their full capacity will admit during ten hours of daily work.

Trains of about two-thirds of full capacity will probably be required in the middle of the day, and consequently the ultimate traffic on each road ought to be estimated at not more than two hundred and forty-eight thousand passenger fares per day, and this is calculated to include the night travel, beyond fourteen hours, which is assumed as a day's work.

In addition to this, each road will be capable of carrying a very large amount of freight during the night, and of doing a large express and light freight business at all hours of the day.

At present we have official information that there are being carried on the horse-railroads of this city over one hundred and thirty-six million passengers per annum, seventy millions of whom are carried upon the lines east of Broadway and Fifth avenue, running north and south. In addition to this, very many millions are carried in omnibuses and upon the Harlem, New Haven, and Hudson River Railroads, by steam power, and by the five Harlem steamboats which run continually throughout the day.

THE business of the horse-railroads and Harlem steamboats is all the growth of a very few years, and the increase during the past year was over twenty (20) per cent. The largest increase being on the lines which run with the greatest speed, showing conclusively the desire of the people for "*rapid transit.*"

THE COAL TRADE.

B. R. WESTERN, COAL EDITOR.

Anthracite Coals.

NEW YORK, July 28, 1871.

WHOLESALE.—The principal event of the week has been the Scranton sale, which took place on Wednesday last, at the usual time and place. As duly announced in our last issue, 130,000 tons were sold. The attendance at the sale was large, and much competition was manifested for the larger sizes of coal. Considering the large amount offered at this sale, the prices realized were entirely satisfactory to the Company and the trade generally. As we predicted in our last, a small advance was realized. Many were under the impression that last month's rates could not be maintained, but it was our opinion that those who have been holding off so long from stocking up, must this month come in the market and lay in a supply. In the early part of the week, prior to the sale, business was a little slack, though at the same time there was that confidence in prices that gave health and strength to trade. Since the sale the tone of the market is much stronger, and buyers are quite free in their contracts. To wait longer for a supply is only to pay higher rates, higher freights, and get poor coal. This fact we pointed out and urged on our readers two months since. One hundred and thirty thousand tons of Scranton coal is the largest quantity ever sold by the company at one time.

There was a full attendance, nearly filling the room in which the sale was conducted. The sale possessed much interest for all dealers in coal, as the prices obtained were expected to be the lowest that coal would bring this season, and would therefore be the basis upon which consumers would immediately begin to lay in supplies. The bidding was very brisk. Lump, steamboat and chestnut coal brought lower prices than at the last sale on the 28th of June, but grate, egg and stove ranged somewhat higher.

Of the 130,000 tons offered, 15,000 were of egg, 43,000 of stove and 17,000 of chestnut. Lump sold at an average of $4 31¾; steamboat at an average of $4 27½; grate at an average of $4 87½; egg at an average of $4 96¼; stove at an average of $5 47, and chestnut at an average of $4 40.

The following shows the highest and lowest prices obtained to-day, with a comparison of the prices obtained for each grade at the last sale in June:

Tons.	July 26.	June 28.
15,000 lump at	$4 40 @4 25	$4 40 @4 30
15,000 steamboat at	$4 30 @4 25	$4 45 @4 35
25,000 grate at	$4 85 @4 80	$4 82½@4 75
15,000 egg at	$5 00 @4 92½	$5 00 @4 90
43,000 stove at	$5 55 @5 40	$5 25 @5 45
17,000 chestnut at	$4 42½@4 37½	$4 50 @4 37½

Anthracite Coal Trade for 1870 and 1871.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending July 22, 1871, compared with week ending July 23, 1870.

COMPANIES.	1870. WEEK.	1870. TOTAL.	1871. WEEK.	1871. TOTAL.
*Phila & Reading R. R.	26,897	1,215,108	106 666	1,771,552
Schuylkill Canal	3,538	95,222	33,480	422,619
Lehigh Valley R. R.	55,601	1,766,532	69,687	882,232
Lehigh & Sus. R. R.	12,440	526,930	38,160	549,526
Lehigh Canal	25,905	270,392	30,945	189,088
Scranton North	20,346	386,914	17,859	150 433
" South	33,323	990,851	41,560	369,934
Penn. Coal Co., rail	23,962	622,691	26,543	228 743
" " " canal	836	9,078	720	4,706
Del. & Hud. Canal Co.	47,564	779,658	37,076	319,348
" " East	5,372	216 642	9 279	131,039
" " West	1.847	44.381	3.557	36,039
South	9,076	247 913	9.486	114,381
Shamokin	14,987	206,532	12,043	341,559
Trevorton	625	42 855	....	....
Lykens Valley Coal Co.	3,098	26,102	2,399	47,312
Wyoming South	9,883	127,480	....	....
Wyoming North	....	....	....	....
P. N. V. C. & R. R. Co.	5,739	169,131	10,098	104,987
Williamstown Co'y	6,749	157,529	....	....
Big Lick Col	3,698	37,039	3,670	70,994
Total	311,566	7.932 971	455,201	5,734,492
1870		5,734,492	311 596	
Decrease		2,198,479		
Increase			143,695	

* Less coal transported for Co's use and Bituminous coal.

Lehigh Canal Coal Trade.

Shipped for the week ending July 21, 1871.

	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total from Mauch Chunk Region	9452 07	9140 11
" " Beaver Meadow "	3129 09	8720 10
" " Treackow "	1334 16	5051 07
" " Mahanoy "	197 01	2387 03
" " Hazleton "	10738 09	31129 09
" " Upper Lehigh "	1132 05	2560 00
" " Wyoming "	4960 17	47758 08
Total	30945 10	189068 08
Corresponding week last year	25904 19	270391 13
Increase	5040 11	
Decrease		81303 05

Bituminous Coal Trade, 1870 and 1871.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending July 22, 1871, compared with week ending July 23, 1870.

COMPANIES.	1870. Week.	1870. Year.	1871. Week.	1871. Year.
C. & O. Canal	15,150	273,931	18,581	358,544
B. & O. R. R.	15,894	461,478	23 369	682,394
H. & B. T. R. R.	5 768	172 396	6,631	201,901
Harrisburg & D.	16,269	434,012	14,240	454,135
L. V. R. R.	1,151	9,380	3,027	44,764
P. & N.Y.C. & R. Co.	5,534	134,774	8,306	175,503
Cumberl'd Branch Canal	1,231	52,189	3,674	100,635
" Railroad	1,813	55,442	940	42,433
Total	62,790	1,593,502	78,768	2,060,609
			62,790	1,593,502
Increase.			15,978	467,107

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Sus. Div.)

Week ending July 22—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1871., tons ct	WEEK 1870. tons ct.	YEAR 1871 tons cwt.	YEAR 1870. tons cwt.
Wyoming Region	38342 01	18963 14	581232 18	641131 02
Upper Lehigh Region	4077 19	3941 16	19061 05	75063 04
Beaver Meadow Region				
Hazleton Region	10796 07	12301 10	31359 15	134570 14
Mahanoy Region				
Treskow Region	3123 19		11549 18	
Mauch Chunk Region	7049 17	66 02	81419 11	30196 01
Totals	6390 03	35293 02	724623 07	880961 01
Increase	28097 01			
Decrease			156337 14	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	38158 19	12440 10	549526 02	526929 15
Forwarded East of Mch Chunk by Canal	19564 02	17940 01	97207 15	207302 02
Delivered at and above Mauch Chunk	1371 07	860 07	30856 16	22884 06
Delivered to L. & B. R. R. at Plymouth Bridge	3922 06	3798 13	26875 19	110264 11
L. V. R. R. at Packer's	373 09	253 11	20156 15	13580 07
Totals	63390 03	35293 02	724623 07	880961 01
Of the above there was transported on acc't of L. C. & N. Co.	10017 00	66 02	108442 00	46849 18
W.-B. C. & I. Co.	25949 10	8825 04	436951 12	286979 18
Totals	35966 10	8891 06	545393 12	333829 16
Increase	27075 04		211563 16	
Decrease				

Philadelphia and Reading R. R.

Amount of coal transported on the Philadelphia and Reading Railroad during the week ending Saturday, July 22, 1871:

	tons. cwt
From St. Clair	37,844 08
" Port Carbon	4,517 00
" Pottsville	2,186 10
" Schuylkill Haven	36,550 02
" Auburn	8,960 05
" Port Clinton	18,457 16
" Allentown and Alburtis	150 04
" Harrisburgh and Dauphin	14,239 13
Total paying freight	122,905 18
Coal for Company's use	2 880 08
Total for week	125,786 06
Previously this year	2,114,586 04
Total	2,240,372 10
To same time last year	1,662,142 13

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, July 22, 1871.

BY RAILROAD—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons. Cwt
From St. Clair	37,844 08
" Port Carbon	4,517 00
" Pottsville	2,186 10
" Schuylkill Haven	36 549 01
" Pine Grove	6,211 12
" Tamaqua	18,457 16
" Harrisburg	34 11
" Dauphin	4,681 02
Total	110,482 00

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	10,603 12
" Mill Creek "	1,673 18
" Schuylkill Valley Scales	687 05
" Mt. Carbon "	1,980 09
" Cressona "	15,784 12
" Pine Grove "	
" Tamaqua "	3,174 09
Total	34,104 05

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap	1,500 13
" Shamokin	3,262 17
" Herndon	
Total	4,763 10

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	1,281 12
" Lebanon & Pine Grove Branch	1,437 06
Total	2,718 18

CONSUMED ON LATERALS.

From Frackville Scales	457 03
" Mill Creek "	184 07
" Schuylkill Valley Scales	358 18
" Mt. Carbon "	669 04
" Cressona "	148 01
" Pine Grove "	28 05
" Tamaqua "	128 13
Total	1,974 09

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	107 03
" " Alburtis, " "	43 01
" " Oreland, G. & N. Br.	1,310 19
" " Connecting R. R.	
" " Willow Street R. R.	177 07
Total	1,638 10

BITUMINOUS.

From Harrisburg	9,478 15
" Connecting R. R., G. & N. Br.	
" Junction R. R.	50 01
Total	9,528 16

COAL FOR COMPANY'S USE.

Anthracite	2 696 05
Bituminous	184 02
Total.	2,880 07

RECAPITULATION.

	Total for Week.	Corresponding week last Year.	
Passing over Main Line and Leb. Val. Branch	110.482 00	25,832 13	i 84,649 07
For Shipment by Canal	34,104 05	3,884 04	i 30,220 01
Shipped Westward via Northern Central R. R.	4,763 10	7,486 15	d 2.723 05
Shipped West or South from Pine Grove	2,718 18	409 12	i 2,309 06
Consumed on Laterals	1,974 09	1,098 05	i 876 04
Lehigh and Wyoming Coal	1,638 10	4,433 13	d 2,795 03
Total Anthracite paying fr'gt	155.681 12	43,145 02	i 112536 10
Bituminous	9,528 16	10,939 06	d 1,410 10
Total of all kinds paying fr'gt	165,210 08	54,084 08	i 111126 00
Coal for Company's use	2,880 07	4,124 06	d 1,243 19
Total Tonnage for Week	168,090 15	58,208 14	i 109882 01
Since Dec. 1, 1870	2.792727 18	1884655 00	i 908072 18
Total to date	2,960818 13	1942863 14	i 1017954 19

SHIPPED BY CANAL.

	Total for Week.	Corresponding week last Year.	
From Schuylkill Haven	30,059 14	3,579 00	i 26,480 14
" Port Clinton	3,420 00	429 0)	i 2,991 00
Total Tonnage per Week	33.479 14	3,808 00	i 29,671 14
Since Dec. 1, 1870	389,139 00	91,586 09	i 297552 11
Total to date	422,618 14	95,394 09	i 327224 05

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, July 22, 1871.

	Tons. Cwt.
From Port Carbon	
" Pottsville	
" Schuylkill Haven	30,059 14
" Port Clinton	3,420 00
Total for week	33.479 14
Previously this year	389,139 00
Total	422,618 14
To same time last year	95,223 09

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for week ending July 22, 1871, previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt
Total Wyoming	15,924 10	254,615 18
" Hazleton	50,022 19	393,655 12
" Upper Lehigh	27 04	755 04
" Beaver Meadow	17,461 07	130,370 06
" Mahanoy	11,459 06	293 223 14
" Mauch Chunk	80 07	6,131 07
" Sullivan & Erie		173 05
Total Anthracite	94,973 13	1,078,925 06
Bituminous Coal from all sources	3,027 00	44,764 00
Total by rail and canal	98,000 13	1,123,689 06
Same time last year	82,374 16	2,184,074 19
Increase	15,625 17	
Decrease		1,060,385 13
Forwarded East from Mauch Chunk by rail	69,687 03	882,231 12
Same time last year	55,601 09	1,060,385 13
Increase	14,085 14	
Decrease		884,300 00

RECAPITULATION.

Forwarded East from Mauch Chunk by rail	69,687 03	882,231 12
To N. C. R. R., at Mount Carmel		2,967 13
Forwarded North from L. & B. Junction	10,098 06	105,161 05
To L. & S. R. R. at Packerton for rail	26 03	3,369 15
Delivered at M'h Chunk	16 04	595 18
Delivered on line of road above Mauch Chunk	341 14	5,839 19
Delivered above Mauch Chunk for use of L. V. R. R.	738 15	27,928 05
To L. & S. R. R., at Penn Hav., for railroad		94 10
Do. for canal	10,738 09	36,164 01
At M. Chunk for canal	3,326 16	14,661 18
Total Anthracite	94,973 13	1,078,925 06
Bituminous Coal	3,027 00	44,764 00
Total all kinds	98,000 13	1,123,689 06

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending July 22, 1871.

	1871. WEEK.	1871. YEAR.	1870. WEEK.	1870. YEAR.
By Railway	26,542 18	228,743 04	23,982 05	622,691 10
" Canal	720 05	4,706 08	835 17	9,077 18
Total	27,263 03	233,449 12	24,818 02	631,769 03

Decrease 1871, 398,319 16 tons.

Huntington and Broad Top R. R. Co.

For week ending July 22, 1871	6,631 tons.
Same time last year	5,768 "
Increase	863 "
Decrease	....
Total amount shipped to date	201,901 "
Same time last year	172,396 "
Increase	29,505 "
Decrease	....

Delaware and Hudson Canal Company.

The following is a statement of Coal transported by the Delaware and Hudson Canal Co., for the week ending July 22, 1871.

	WEEK.	SEASON.
By Delaware and Hnd. Canal,	37,076 00	319,348 00
By Railroad East,	9,279 00	131,039 00
" West,	3567 00	36,039 00
" South,	9426 00	114,381 09
TOTAL TONS,	59,398 00	600,807 00
For the same period last year.		
By Delaware and Hudson Canal	47,564 00	779,658 00
By Railroad East,	5372 00	216 642 00
" West,	1847 00	44,381 00
" South,	9076 00	247,913 00
TOTAL TONS,	63,859 00	1,288,594 00

Delaware, Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna and Western R. R. for week ending July 22, 1871.

	Week. Tons. Cwt.	Year. Tons. Cwt.
Shipped North	17,859 04	150,433 02
Shipped South	41,560 08	369,934 09
Total	59,419 12	520,367 11
For the corresponding time last year:		
Shipped North	20,346 03	386,914 00
Shipped South	33,323 07	990,851 02
Total	53,669 10	1,377,765 02
Increase	5,750 02	
Decrease		857,397 11

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, July 22, 1871.

	WEEK.	SEASON.
North	49,703 09	446,576 15
South	9,486 07	114,381 00
Total	59,189 16	560,957 15
Corresponding time in 1870:		
North	41,801 11	1,259,613 10
South	9,076 04	247,912 14
Total	50,877 15	1,507,524 04
Increase North		
Decrease South		
Total decrease		946,566 09

Shamokin Coal Trade.

For week ending July 22, 1871	12,045 19
Same time last year	14,987 06
Increase	
Decrease	2,941 07
Total amount shipped to date	341,559 01
Same time last year	206,531 11
Increase	135,027 10
Decrease	

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday July 22, and during the year 1871, compared with the corresponding period of 1870.

WEEK.

	To C. & O. Canal Tons. Cwt.	To B. & O. R. R. Co. Tons. Cwt	Total. Tons Cwt.
1871	18,560 13	23,368 16	41,949 09
1870	15,129 19	15,893 18	31,023 17
Increase	3,450 14	7,474 18	10,925 12
Decrease			

YEAR.

1871	358,843 16	682,394 08	1,041,238 04
1870	273,931 04	461,478 05	735,409 09
Increase	84,912 12	220,916 03	305,828 15
Decrease			

Cumberland Branch

WEEK.

	To C. & O. Canal. Tons. Cwt.	To B. & O. R. R. Co. Tons Cwt.	Total. Tons. Cwt.
1871	3,674 09	940 09	4,614 18
1870	1,231 06	1,813 07	3,044 13
Increase	2,443 03		1,570 05
Decrease		872 18	

YEAR.

1871	100,634 15	42,432 13	143,067 08
1870	52,188 18	55,441 19	107,630 17
Increase	48,445 17		35,436 11
Decrease		13,009 06	

Report of Coal forwarded by Pa. & N. Y. R. R. Co., for week ending July 22, 1871.

	BITUMINOUS. Tons.	Cwt.	ANTHRACITE. Tons.	Cwt
By Rail	8,306	07	10,098	06
Previously this year	167,197	00	94,888	13
Total by Rail				
By Canal				
Previously this year				
Total by Canal				
Total for the year	175,503	07	104,986	19
To the same time last year	134,674	00	169,130	18
Increase	40,829	07		
Decrease			64,143	09

Line Prices for Coal August, 1871,

	Lump	Broken	Egg	Stove	Ches't
At Manch Chunk	4.50	4.00	4 00	4.25	3.50
" Wilkesbarre,	3 75	3.75	3.75	4.00	3.25

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK. July 22. R. A.	W. A.	AT PHILADELPHIA. July 23. R. A.	W. A.
SCHUYLKILL.				
Lump	$—	$—	5 50	4 50
Steamer	6 00	— —	— —	4 50
Broken	6 00	— —	— —	— to 4 75
Egg	6 25	— —	— —	— to 4 75
Stove	6 50	— —	— —	— to 5 00
Chestnut	5 75	— —	— —	— to 4 25
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	6 75	— —	— —	— —
Broken	6 10	— —	— —	— —
Egg	6 00	— —	— —	— —
Stove	6 50	— —	— —	— —
Chestnut	5 50	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A. 5 50@7 00		— —	— —
New England	" —	—	— —	— —
Locust Mountain	W. A. 6 50		— —	— —
Honey Brook, Le'h	W. A. 5 00@6 25		— —	— —
Spring Mountain	" " 5 00@6 25		— —	— —
Sugar Creek	" " 5 00@6 25		— —	— —
Sugar Loaf	" " 5 00@6 25		— —	— —
Old Comp'y's	" " 5 00@6 25		— —	— —
Cross Creek	" " 5 00@6 25		— —	— —
Room Run	" " 5 00@6 25		— —	— —
Girardville	" " —		— —	— —
McMichael	" " — —		— —	— —
Shamokin	" " 5 25		— —	— —
Lykens Valley	" " 5 75		— —	— —
Broad Top	" " 5 25		— —	— —
Hill & Harris	" " 5 25		— —	— —
Henry Clay	" " — —		— —	— —
Powelton	" 5 25		— —	— —

*Dealers in these coals may be found in our advertising columns.

Company Coals.

August, 1871.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton E. Port	4 70	4 80	5 10	5 50	5 75	4 75
*Pittston at Newburgh	4 50	4 50	4 70	4 80	5 00	4 30
*Lackawana at Rond't	— —	— —	— —	— —	— —	— —
Wilk'b're at Hoboken	4 75	4 75	5 00	5 25	5 75	4 75
Old Co. Lehigh at Pt John'n	6 25	— —	5 65	5 50	6 00	5 00
Lehigh at Eliz. Port	6 25	— —	5 65	5 50	6 00	5 00

For freights to different points see "Freights."
* To contractors.

Prices at Baltimore—August, 1871.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 25@5 50
Pittston and Plymouth, do	5 25@5 40
Shamokin Red or White Ash, do	5 25@5 40
Lykens Valley Red Ash, do	— —@5 80
Zerba Valley	— —@— —
Treverton	— —@— —
By retail, all kinds per ton of 2240 lbs.	7 00@7 50
Georges Creek & Cumberland f. o. b. at Locust Point for cargoes	— —@4 75
Fairmount and Clarksburg gas, f. o. b. at L. Point	6 00@6 50
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein f.o.b. at Phila	$ —
Lemon " " "	—
Cumberland Vein Coal	—
Consolidation Coal Co.'s on board N. Y.	6 75
Maryland Coal Co. " "	6 75

Prices at Georget'n, D.C., & Alexandria, Va.

August, 1871.

George's Creek and Cumberland f. o. b. for shipping...$4 50@4 60,

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$5 50@5 75
Lykens Valley	6 00@6 25
Shamokin Red or White Ash	5 50@6 00
Trevorton and Zerba Valley	— —@— —

Prices of Gas Coals.

August, 1871.

PROVINCIAL.

Corrected weekly by Louis J. Bellomi, Jr., 41-43 Pine st., N. Y

Duty, $1 25, gold

	Coarse	Slack.
Block House	$1 75	@-1 75
Gowrie	1 75	@-1 75

Corrected by Bird, Perkins & Job, 86 South street.

	Coarse.	Culm of Coal.
Pictou	$2 25	@1 25
Sydney	2 25	@- 80
Lingan	1 60	@- 80
Little Glace Bay	1 60	@1 00
Caledonia	1 60	@- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal. 25 per cent. ad valorem on the Culm of Coal.

AMERICAN.

	Currency.
Westmoreland	7 10 @7 25
Fairmount Gas Coal Co. of N. Y.	7 50 @- —
Despard Coal Co	$7 50 @- —
Penn	7 75 @8 00
Newburg Orrel Gas	— — @- —
West Fairmount Gas Coal	8 00 @- —
AT PHILADELPHIA.	
Powelton	.$7 75
TO NEW YORK.	
Provincial.	
Sidney	$ —
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—
TO BOSTON.	
Sydney	$ —
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—

Prices of Foreign Coals.

August, 1871.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, N. Y.

Liverpool Gas Coking	$ 9 00@— —
" Cannel	11 50@12 50
" House "	— —@16 00
" Orrel	12 00@14 00
Per ton 2,240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@17 50
" Cannel, "	18 00@20 00
Per ton 2,000 lbs. delivered.	

Foreign and Provincial Freights.

August, 1871.

Foreign.	
Newcastle and Ports on Tyne, per keel of 21 1-5 tons	£14 00@£16 00
Liverpool, 5 per cent primage	13s @15 ton,

Freights.—August, 1871

TO EASTERN PORTS.	Cumberland. From Georgetown.	From Baltimore.	Anthracite. From Philada.	From East Port, Port Johnston, and Hoboken.	From Newbury	From Rondout
Amesbury			$2 50	$1 75		
Bangor	$2 75		2 30	1 50		
Bath	2 75	2 75	2 30	1 75		
Boston	2 50	2 50	2 25	1 50	180	1 80
Bridgeport	2 25	2 25	1 90	1 00	1 10	1 25
Bristol		2 60	2 00	1 25		1 55
Cambridgeport			2 75	1 75		
Derby			2 00	— —		
Dighton	2 30	2 35	2 30	— —		
East Cambridge			2 35	1 75		
Fall River	2 25	2 25	2 25	1 25	1 40	
Hackensack			1 75	1 00		
Hartford	2 75		2 30	1 60		
Jersey City		2 00	1 40	50	70	
Middletown			2 25	1 30		
Mystic			— —	1 30		
New Bedford	2 50	2 35	2 00	1 25		
Newburyport	2 75		2 40	1 60		1 35
New Haven	2 25	2 25	1 90	1 00	1 10	2 20
New London	2 25	2 25	1 76	1 10		1 25
Newport			2 00	1 30		1 40
New York	2 00	2 00	1 35	50	70	65
Norwalk			1 80	1 00	1 10	
Norwich	2 25	2 25	2 00	1 20	1 40	1 50
Pawtucket	2 50	2 40	2 30	1 40		1 65
Portland	2 50	2 60	2 30	1 50		2 00
Portsmouth, N. H	2 75	2 75	1 45	1 60		1 50
Providence	2 25	2 25	2 00	1 40	1 50	
Rockport			2 10	1 55		
Saco	2 75		2 25	1 75		
Sag Harbor			1 70	1 20		
Salem	2 60	2 75	2 35	1 50		
Stamford			2 00	1 00	1 10	
Stonington			2 00	1 25	1 20	1 40
Taunton			2 30	1 60		
Warren			— —	1 30		
Washington			1 25			
TO RIVER PORTS.						
Albany		80			55	
Catskill		70			50	
Cocksackie		70			50	
Coeyman's		70			65	
Cold Spring	2 20	70			30	
Fishkill		70	1 60		30	
Haverstraw					60	
Hudson	2 20	2 25			60	
New York					60	
Nyack			1 75		30	
Poughkeepsie					30	
Rhinebeck						
Rondout					75	
Saugerties			1 60		40	
Sing Sing					75	
Stuyvesant					75	
Tarrytown					75	
Troy					55	
West Point			1 75			
Yonkers					60	

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption	$1 95
For reshipment	1 85

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 84
C. R. R., N. J., Phillipsburgh to Elizabethport	2 15
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$3 24

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 84
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 25
Shipping expenses	25
Wharfage	10
Total	$2 44

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Phillipsburgh	$ 84
Morris & Essex R. R. Phillipsburgh to Hoboken	1 45
Shipping expenses	25
Warfage	10
Total	$2 64

TO SOUTH AMBOY.

L. V. R. R.	84
B. & D. R. R. / Cam. & Am. R. R.	1 15
Shipping Expenses	25
Total	$2 24

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	.99
C. RR. of N. J. Phillipsburgh to Elizabethport	125
Shipping expenses	25
Wharfage	10
Total	$ 2 59

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	Toll..$1.25	Freight.,90c.	$2 15
" Port Carbon			
" Port Clinton	" 1.17	" 8 c.	2 02

* TO NEW YORK.

From Schuylkill Haven ....Toll..1 25 Freight..$1 90..$3 10

The Rates of Toll on Lump and Steamer Coal will be ten per cent less than the above rates. The charge will be per ton of 2240 lbs. No charge less than Forty Cents per ton will be made for any distance. A drawback of thirty cents is allowed on all coal passing Fairmount Locks used at Philadelphia and vicinity.

Via Lehigh Canal.

TO PHILADELPHIA

Lehigh Canal	$ 80
Freight and towage	1 10
Total	$1 90

TO NEW YORK.

Lehigh Canal	$ 50
Morris Canal / Freight / Towing	2 11
Total	$2 61

TO JERSEY CITY.

Lehigh Canal	$ 50
Morris Canal, Freight	2 09
For re-shipment	2 59

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 50
Delaware Division Canal	30
Delaware and Raritan Canal	46
Freight	1 05
Towage	20
Total	$2 51

TO NEW BRUNSWICK.

Lehigh Canal	$ 50
Delaware Division Canal	30
Delaware and Raritan Canal	46
Freight	1 05
Total	$2 31

MARKET REVIEW.

FOR THE WEEK ENDING JULY 29, 1871.

IRON.—A more active demand has sprung up for American Pig, with sales for prerent and future delivery of about 3,500 tons at $35 for North River, and $35 50@$36 for Lehigh Valley and other No. 1 brands, showing a firm market and full prices. Scotch has moved moderately, the sales being 150 tons Glengarnock at $32 50; 100 do. Eglinton, from yard, $32; and small parcels Gartsherrie, $33@$33 50. Of other kinds we notice 1,000 tons American Rails, 750 do. English, deliverable at New Orleans, on terms not made public, and 350 do. old Double-headed, $39 50, gold. Refined Bar continues firm but very quiet, and nominally unchanged. Common sheets are steady at 4½@5¾c., for Singles, Doubles, and Trebles, and STEWART & Co.'s S. Easton, R. G. 5¾@6¼c. for Double and Trebles—English R. G. is about the same as the American R. G.

LEAD.—the demand for Pig is very limited, and we hear of no sales. Nominal price for ordinary Foreign $6 12½@$6 15, gold. Bar 9¼c., Sheet and Pipe 10¼c., and Tin-lined Pipe 16c.—usual discount to the Trade.

COPPER.—The manufactures of Cepper and Yellow Metal are steady at our quoted rates. For Ingot, a speculative demand has been developed, and the business has been quite large, closing at prices a little higher than before; the sales are 500,000 lb. Lake at 21¾@22c. for immediate, and 22¼@22½c. for short forward delivery; and 600,000 Detroit and Lake, for August delivery, 22¼c.

STEEL.—All descriptions are steady, but not active, at our quotations.

SPELTER.—Foreign is dull; we quote nominally as before, say $5 81¼@$6 12½ ₱ 100 lb., gold.

TIN.—There has been renewed activity in Straits Pig, and the sales are large at a further advance in prices; the transactions embrace $3,500 slabs here; and $1,500 do. to arrive here and at Boston, at 35c.; 1,000 do. on the spot, 35¼@35½c.; and 500 do. 35½@35¾c., closing firm at 36c. English and Banca are unchanged, but firm, and tend upward, in sympathy with Straits; 200 slabs Banca sold at 40c., and 35 tons English 34¼@35c., all gold. The latest telegrams from London quote English £138, Banca £136, and Straits £135; from Singapore, $35 per picul. The market for Plates is not as active as a week or two ago, but there is still a fair demand, and prices remain quite firm; sales have been made of 500 boxes Charcoal Tin at $8 75 for I. C.; 250 do. Coke Tin, 14 by 20, $7 62½@$8; 300 do., $8 12½; 450 do., $8@$8 25; 500 do. Charcoal Terne, $8 25@$8 50, all gold: and 500 do. Coke Tin, on private terms.

ZINC.—Sheet continues steady at 9c., currency, for No. 9 from store, and 7¾c., less 4 ₱ cent., gold, from Mosselmann and agents' hands. French Oxide, 9½@10½c.; American, 6½c.; Manganese, 4½@5c.

METALS.

NEW YORK, July 26, 1871.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, $7 ₱ ton; Polished Sheet, 3 cts. ₱ lb; Galvanized 2½; Scrap Cast, $6; Wrought, $8 per ton.

	Store Prices.
Pig, Scotch No. 1, ₱ ton	31 00@34 00
Pig, American, No. 1	35 00@36 00
Pig, American, No. 2	33 00@34 00
Pig, American, Forge	31 00@32 00
Bar Refined, English and American	73 00@74 00
Bar Swedes, assorted sizes (gold)	95 00@100 00
	Store Prices, Cash.
Bar, Swedes, ord'y sizes	105 00@115 00
Bar, Refined, ord'y sizes	75 00@— —
Bar, Refined, ¼ @ 5-16 inch	82 50@— —
Bar, Common	70 00@ 72 50
Scroll	95 00@125 00
Ovals and half-round	95 00@120 00
Band	90 00@ 95 —
Horse Shoe	95 00@100 00
Rods, ¼ to 3-16 inch	82 50@120—
Hoop	100 00@140 00
Nail rod	— —@6¾ —
Sheet, Russia, as to assortment (gold)	12¼@12¾
Sheet, Single, D. and T. Common	—4¾@— 5¾
Sheet, Galv'd, Nos. 14 to 25, 30 ct. dis.	12@14c ₱
" " Nos. 27, 28, and 29, 30 ct. dis.	15@18c ₱
Rails, English (gold), ₱ ton	— — @57 00
Rails, American, at Works in Pa	70 00 @72 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 3½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 15 @— 18
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 10 @— 17
English Machinery	— 11½@— 14
English German (2d and 1st quality)	— 12 @— 14
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— 15 @— 16
American, Spring, do.	— 9 @— 11
American Machinery, do.	— 10 @— 11
American German, do.	— 9 @— 11

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 30
Copper Bolts	— @— 32
Copper Braziers, 16oz. and over	— @— 32
Copper Nails	33 @— 38
Copper, Old Sheathing, &c. mixed lots	— @— 19
Copper, old, for chemical purposes, 14@16 oz.	20 @— 21
Copper, American Ingot	21¾@— 22
Yellow Metal, New Sheathing & Bronze	— @— 22
Yellow Metal Bolts	24 @— —
Yellow Metal Nails	— @— 22

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

Galena, ₱ 100 lbs	$— @— —
Spanish (gold)	6 12½@6 15
German, do.	6 12½@6 15
English, do.	6 15 @6 50
Bar (net)	9 25 @— —
Pipe (net)	— — @10 25
Sheet	— — @10 25

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ₱ lb.

SPELTER.—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (god) p. 100 lb, 5 75	@ 6 25
Plates, Domestic p. lb, — 7	@— 11

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent.; Roofing 25. ad val.

	Gold ₱ lb.
Banca	40 @40½
Straits	35¾@36
English	34¾@35

PLATES. Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ₱ box	$8 75 @9 00	$10 25 @10 75
I.C. Coke	7 50 @8 50	9 00 @10 00
Coke Terne	6 25 @7 50	7 25 @ 9 00
Charcoal Terne	8 00 @8 50	9 50 @ 10 00

ZINC.—Duty: Pig or Block, $1 50 ₱ 100 lb.; Sheet, 2½cts. ₱ lb.

Sheet, No. 9 Foreign ₱ lb.— 9 @— —

Mining Stocks.

NEW YORK, July 27, 1871.

We have but little to report different from last week in reference to operations in the Mining Stock Board. Grass Valley and La Crosse are reported as having advanced. All other stocks on the list are weaker. No sales. Canada Mining, Copper, is quoted at 50. The following is the report in full:-

GOLD STOCKS.

	BID.	ASKED.
American Flag	12	—
Bates & Baxter	25	—
Benton	—	5
Black Hawk	—	40
Central Gold	5	9
Cons Gregory	30	40
Grass Valley	8	12
Gunnell	15	—
Holman	—	—
La Crosse	19	22
Liberty	—	—
Mariposa prf	—	—
Montana	—	—
Rocky Mount	—	5
Quartz Hill	—	31
Smith & Parmlee	22	50
N. Y. & Eldorado	—	—

Petroleum is notably inactive. There is scarcely a change in the quotations, as compared with last week—a similar remark, which we applied then to the quotations of the week previous. No sales have transpired, and we quote nominally as follows.

PETROLEUM STOCKS.

	BID.	ASKED.
Bennehoff Run	20	—
Bergen Coal and Oil	15	—
Bliven Oil	30	—
Blood Farm	—	50
Brewsoort	30	50
Buchanan Farm	40	—
Central	60	66
Clinton	—	—
Home	145	—
National	—	—
New York & Allegheny	—	70
Northern Light	30	—
Phillips Pet	—	15
Pithole Creek	—	—
Rathbone Oil	24	—
Rynd Farm	35	40
Second National	—	—
Sherman & B	—	—
Tarr Farm	—	—
United Petroleum Farms	—	33
United States	—	66

San Francisco Stock Market.

"By Telegraph."

Our report from the San Francisco Mining Stock Board is dated California, July 25. The report does not indicate any very material alterations since our last. Gould & Curry has advanced $13 per share. Savage has slightly advanced. All other stocks on the list are weaker. No sales of Kentuck have transpired during the week; that capricious commodity will probably remain temporarily inactive, as a "constitutional necessity," since its recent unusual activity. Sales of Ophir were effected on the 21st inst., at 8¾. The report of the Board is as follows:

Savage	41
Yellow Jacket	61½
Kentuck	No sales
Challar Potosi	43
Gould & Curry	120
Belcher	225
Imperial	37
Amador	—
Crown Point	300
Hale & Norcross	—

Weekly Slate Trade Report—Hydeville.

ROOFING SLATE.

Week ending July 22, 1871.

NAME OF COMPANY.	WEEK.	PREVIOUSLY.	TOTAL FOR YEAR.
Eagle Slate Co	115	2930	3045
Western Vermont Slate Co	....	314	314
Blue Slate Co	40	1470	1510
The Evergreen Slate Co	235	2754	2989
Forest Mining Slate Co	....	444	444
West Castleton Slate Co	....	....	....
E. D. Billings	125	734	859
R. M. Copeland	....	404	404

VERMONT SLATE TRADE.

REPORT of Slate Shipped from Middle Granville, N. Y., via the R. & S. R. R., for the week ending July 22, and for the year 1871.

ROOFING SLATE.

NO. OF SQUARES.	Week.	Prev'ly.	Year.
†Penrhyn Slate Co	355	2730	3085
New York, *and Middle Granville Slate Co.	65	2830	2895
†American Slate Co	....	....	....
Benj. Williams	40	905	945
Jones & Williams	....	90	90
Eagle Slate Co	....	270	270
Mettowee Slate Co	65	505	570
Albany Slate Co	....	375	375
H. W. Hughes	....	....	....
Total	....	....	....

MILL STOCK, MANTLES, &c.

NO. OF CASES SHIPPED BY	Week.	Prev'ly.	Total.
Eagle Slate Co	....	....	....
Penrhyn Slate Co	167	2621	2788

BLACK BOARDS.

NO. OF CASES.	Week.	Prev'ly.	Total.
Eagle Slate Co	....	....	....
Penrhyn Slate Co	....	....	....

MILL STOCK, &C.

NO. OF CARS SHIPPED BY,	WEEK.	PREV'Y.	YEAR.
Eagle Slate Co	....	22	22
Penhryn Slate Co	....	....	...

* Sales made together this season.
† Consolidated Sales.

Railways Time of War.

CAPTAIN TYLER has written an interesting letter on the subject of the military use of railways, observing that in future the success or otherwise of combined military and naval expeditions from England may, in great measure, depend upon the promptitude with which railway communication can be established. He urges the desirability of a proportion of the officers and men of the Corps of Royal Engineers being specially trained and practised in such duties. The subject is engaging the consideration of the Royal Engineers at the War Office.

Dynamite.

M. GUYOT contributes a paper to a French cotemporary containing the following interesting observation, which is not by any means unimportant: The substance known as dynamite (consisting essentially of nitroglycerine absorbed by any suitable inert powder) is met with in the trade made up in cartridges weighing, on an average, 71 grms., and packed in boxes weighing, with contents, about from 25 to 30 kilos. The author, happening to have in his possession a number of cartridges containing dynamite (the body of the cartridges is made of stout grey paper), found that these objects, after some lapse of time, became moist and oily looking, and a cardboard box in which the cartridges were kept was also found impregnated with a liquid, which, on investigation, turned out to be nitroglycerine. A small piece of the paper so impregnated exploded violently when brought into contact with glowing coals, and the like effect was observed when a piece of the paper was laid upon an anvil and smartly struck with a hammer. The author also found that the wood of the boxes in which dynamite cartridges are kept becomes, by slow degrees, impregnated with nitroglycerine, and thereby a most dangerously explosive material, which may give rise to serious accidents in warehouses where dynamite is kept.

The same journal also contains a notice of the use of this explosive for breaking up heavy masses of cast-iron. The account is rather long, and records the results of some experiments made upon an anvil belonging to a steam hammer, and weighing over 5 tons, which was broken up into lumps of suitable size for the purpose of being smelted down, by the aid of two small charges of dynamite.

WANTED—

By a young man, recently graduated, a position in a *Mining Engineer Corps*, or Metallurgical Works. Address Engineer Box 15, Montgomery, Orange Co., New York.

DEPARTMENT OF POPULAR SCIENCE.

Circles of Sensation.

THE sense of locality, Madam, gives us a perception of the situation, size, and form of the portions of the skin subjected to pressure, heat, or cold. It does not always tell us accurately as to pain; for we can have the sensation of pain at a part of the skin where it is not caused, simply by irritating, somewhere on its intermediate course to the brain, the nerve which comes from that part. But sensations of touch proper, as we have already distinguished them, carry with them the token of locality. What that token is, we do not know; but we assume that it is a slight but constant peculiarity in the signal transmitted over each nerve-wire of the whole body.

Telegraphic operators get so well acquainted with each other's style of signalling, that they can tell instantly when a stranger, a thousand miles away, takes the place of the usual operator. Our consciousness is further assisted by the fact that each operator, so to speak, always has his own wire, which nobody else uses. And the nerve-filaments which terminate under the skin are kept distinct until they unite with the brain. Sixty-two great bundles of them unite in the spinal cord; but in these bundles, and in the spinal cord itself, the separate filaments exist side by side, like insulated wires in a telegraph cable.

When the baby was born, Madam, he didn't know these nerves apart. He had to acquire by experience a familiarity with the peculiar signal or token of each one. Sight and the muscular sense helped him, though these teachers were themselves but scholars, learning of the other senses. He put his thumb in his mouth, and (repeating this process frequently) learned the signals of the thumb-telegraph and the mouth-telegraph. You didn't know he was pursuing scientific investigations. You thought he was merely acquiring a bad habit.

For my part, I am astonished when I consider what children learn before they are three years old. All the schoolmastering of the rest of life is nothing to the complicated education required to give them the use of their seven senses—sight, hearing, touch, taste, smell, the muscular sense, and the sense of locality. The latter is essential to the use of all the rest, and is not innate, but must be laboriously acquired by practice.

The whole skin is covered with these sensitive points, or telegraph stations, each having its own signal, recognizable by the mind. Yet the number of nerves is not infinite, and one might suppose that between the sensitive points there were spaces incapable of sensation. Yet you know very well, Madam, that you cannot with the finest cambric needle find a spot where pressure will not be felt. It is true that the whole skin is sensitive; yet each point is not provided with a separate nerve. But there is always a nerve extremity near enough to receive the sensation of pressure or temperature communicated through the skin. To make sure of this, the nerve-fibre frequently terminates in several branches. Now all these branches must use the same nerve in transmitting currents to the brain. Hence the nerve does not tell absolutely where the sensation is produced. It only indicates a certain small area of the skin. Perhaps two of the branches have been excited at once; no matter, there will be but a slight sensation recognized at the brain.

The area of surface employing a single nerve is termed the circle of sensation; and it is easy to determine how large it is. For instance, bandage a person's eyes, without telling him what you are going to do; then take a pair of blunt compasses, open the points half an inch, and touch both points at exactly the same instant to the back of his hand. He will receive but a single impression. A similar experiment may be tried upon the skin of the back, with the points as much as two inches apart, without causing a double sensation. In front of the ear, the points may be three-quarters of an inch apart, and give but a single sensation; but if you draw them lightly across the face to the other ear, at a certain point the single sensation will change into a double sensation; as they approach the mouth, they will seem to separate more widely, and on the other side of the face they will seem to draw together again, until the double impression is lost in a single one.

If both points are within one circle of sensation, of course they can give but one impression, since they affect but one nerve; but it will not do to say that if one point is within one circle, and the other within an adjacent circle, there will be a double sensation; for the points must be a certain distance apart, turn them how you will, before they will give a double sensation. Now, it is evident that by straddling the line between two adjacent circles of sensation, we could put a point in each without separating them widely. Moreover, it would be possible, if adjacent circles gave distinctly separate impressions, to set the point of a pin (by repeated trials) exactly on the line between them, and thus affect both nerves and produce two separate signals. But this is not the case. Hence it is supposed that to feel two distinct sensations, at least one circle not touched must lie between those that are touched. The mind seems to take note of the intervening spaces, saying, as it were, "No. 14 and No. 16 are touched; there are two sensations, one space apart." And, moreover, we estimate the distance, not in accurate measurement, but according to the number of circles untouched. Thus the compass points appear to be together at the ear, though they are three-quarters of an inch apart. But as the mouth is neared, they appear to be gradually separating, because the nerves are more numerous around the mouth, the circles of sensation are smaller, and thus there are more circles untouched between the points.

We do not, in fact, know how large these circles actually are, because this supposition of one intervening circle is quite arbitrary. For all we know, it may be necessary that at least two, or three, or five intervene. But their relative magnitude in different parts of the body may be measured, and thus the relative sensitiveness of different parts may be ascertained. Of course, the parts having the smallest circles of sensation, or in other words the greatest number of nerves, will be most delicate in touch, that is, will distinguish two separate sensations at the smallest distance. Careful measurements have shown that the tip of the tongue is the most sensitive, and the inside or ball of the tips of the fingers next, the sense of touch being much more obtuse in the second finger joints, still more so in the palm of the hand, and most of all in the cuticle of the upper arm, the back, and the thigh. On the back, as I said, two points, two inches apart, may give but a single sensation; on the tongue they cannot be separated more than one-twenty-fourth of an inch without giving the double sensation. Hence, if this theory be correct, the circles of sensation must be 2304 times larger on the back than on the tongue. Evidently, Madam, that portion of your body is most abundantly provided with nerves which has the most to do. But I hope your tongue will never indulge in back-biting; you see it must be a mean use of a great advantage!

R. W. R.

[NOTE.—It is scarcely necessary to say that this and the preceding articles on the senses, published in our Department of Popular Science, do not pretend to originality. Nor has the author felt called upon to give the authorities from which he has drawn his facts and many of his illustrations. The serious student will find all that is important in these light sketches, and much more, in the Smithsonian Reports for 1865 and 1866.—ED.

A New Material for Ropes.

THE manufacture of Canada thistles into ropes and textile fabrics, it is said, is about to be attempted, on a scale that will, at least, settle the practicability of the process, whatever it may do for the manufacturers. The woody portion is said to furnish, under the treatment of a recent invention, an exceedingly strong, flexible, and readily-worked fibre, superior to flax or hemp.

New Publications.

THE ROADMASTER'S ASSISTANT AND SECTION MASTER'S GUIDE: A manual of reference for all having to do with the permanent way of American Railroads, and containing the best results of experience and minute direction for track-laying, ballasting and keeping the track in good repair. By WILLIAM S. HUNTINGTON. Railroad Gazette Series. Chicago: A. A. Kellogg, 110 and 112 Madison street. 1871. Price $1.

THIS little volume is intended to afford to the practical man the means of acquiring information of value to him in his business, and to correct certain erroneous practices into which many track-layers have fallen. The author's conclusions are, we are informed the result of many years of practical experience, and have been substantiated by actual experiment and practice. The chapters on spikes and the treatment of rails, previous to and during the operation of laying the track, contain many hints which alone are worth many times the cost of the book. It also contains valuable chapters on ballasting track, track repairs, culverts, turnouts, etc. Not the least recommendation to the book is that it is endorsed by the *Railroad Gazette*, and issued by the publisher of that journal.

Tampering with Coin.

THE last report of the assayer of the mint of Philadelphia contains some interesting information in regard to the various methods of counterfeiting gold coins, or abstracting from them a part of their value. In one lot of $1000, there were 34 double eagles. Two of these had been burnt or blistered, but as they were very slightly under weight, the object of the roasting has not been discovered. The other pieces were all from 10 to 20 grains light—that is, reduced from 40 to 80 cents in value. One was filed smoothly nearly all around the outer edge, but all the others retained the "milling" which had been restored after the filing. In this way 50 cents worth of gold was taken from each piece, without sensibly diminishing its diameter. In one or two cases, where from 22½ to 58½ grains had been taken away, the eye would detect the loss.

One piece was reduced by the use of acids. This treatment makes the surface rough, so that it is easily detected. In the same lot there were ten eagles which had been filed, and two treated with acid, the latter being quite spoiled. A number of counterfeits were found in the same lot. The best piece was light only two and a half grains, but some of its lettering was very bad. This piece contained about 69 per cent. pure gold, the genuine coin containing 90 per cent. Some of the poorer pieces contain only about 50 per cent. Another lot of coins had been split, and filled with platinum. The best method of detecting filled or counterfeit pieces is by finding their specific gravity by weighing in water.

Ebbw Vale Steel, Coal, and Iron Company.

THIS company is about to erect a wire railway at Bredon Hills, with a view to the removal of spathose ore. With the aid of this ore, and spiegeleisen made from it, the directors expect to be able by this time next year to turn out 800 to 900 tons of steel per week. The company is about to issue 5 per cent. debentures to the extent of £100,000, repayable in three, five, seven, or ten years. The chairman has increased his holding in the company from 600 to 1500 shares. Another director has also increased his investment in the company from 700 to 3700 shares. Wire tramways are beginning to be adopted at the iron mines of the Forest of Dean and Somersetshire for the conveyance of ore to the local railways. These tramways seem destined to exert a rather important influence on local industry.—*Engineering.*

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
WILLARD P. WARD, M. E.,
Editors.

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The Postage on THE ENGINEERING AND MINING JOURNAL *is twenty cents a year, payable quarterly, in advance, at the office where received.*

THE SCIENTIFIC PUBLISHING COMPANY,
WILLARD P. WARD, MANAGER,
37 PARK ROW,
P O. BOX 4404. NEW YORK CITY.

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Coal, Water and Iron on the Union Pacific Railroad

WE watch with interest the signs of development and progress in the region along the Pacific Railroad. Already it is certain that, in a large and profitable way, business will grow up under the wise management of the railroad company.

The coal on the line of the road, in Wyoming Territory, is acknowledged to be abundant and excellent. It is easily and cheaply mined, and is sent in large quantities to Salt Lake City. The remaining local consumption is of course small. One or two shipments have been made to San Francisco, under very low rates of freight, fixed by the Central and Union Companies. In the San Francisco market this coal finds no rival at its price, being superior to that of Billingham and Coast Bay, and of course, *a fortiori*, to that of Monte Diablo.

Profitable shipments of the Wyoming coal to the East cannot at present be made, although it commands two dollars per ton more in the market at Omaha than the Iowa coal. The expense of transporting it 680 miles, which cannot be less than a cent per mile, is sufficient, at present prices, to counterbalance the advantage of quality. The locomotives on the railroad of course employ Wyoming coal, since it is an excellent steam-generator.

There are no metallurgical works in the West where this coal is used as fuel. It is true, the railroad company experimented with it in reheating pig iron, and with not altogether unfavorable results; but the fact that the company, although many of its officers are interested in the coal mines, does not regularly use it for this purpose, is a significant indication that some other fuel is found to be cheaper and better. It has been asserted that some varieties of the Wyoming coal will coke—a fact which deserves attention, since if substantiated, it will be of high importance to future metallurgical industry. Unfortunately, it has been denied as positively as it was asserted; and the matter is at present somewhat doubtful. We hope to receive at an early day additional evidence on the subject.

The railroad is transporting at present large quantities of ore from Utah, most of which goes to Swansea. The Balbach works at Omaha, it appears, have ceased to treat ores, and are now confined (if our information is correct) to the separation of lead bullion, by BALBACH'S zinc process. This bullion is received from the numerous smelting-works of the interior.

An enterprise of great importance to the country has been the boring by the railroad company of an artesian well in the Bitter Creek region. The well was bored without difficulty in a reasonably short time to the depth of a thousand feet, and an abundance of pure, soft, sweet water was obtained. Indeed, plenty of good water was reached at a much smaller depth; but the work was continued, in the hope of obtaining a flowing well. This expectation was not realized; though we do not doubt that some other experiment of a similar kind will be more successful. At any rate, it is demonstrated that water can be found even in the most forbidding "alkali desert"; and the company, we are glad to know, purposes to continue operations of this beneficent character.

Meanwhile, other discoveries in Wyoming Territory add no little to the prospect of future wealth. The great iron deposits near Cheyenne have attracted considerable attention of late; and if half that is said of them is true, they will offer an extraordinary opportunity for solid and successful mining and metallurgical enterprise. In view of these discoveries, the question of the Wyoming coal as a metallurgical fuel becomes more important than ever. We trust that Professor HAYDEN, who has studied this region a good deal, and who is amply provided by Congress with funds for the prosecution of his geological surveys, as Geologist of these Territories, will think it worth his while, even at the risk of missing a fossil or two somewhere, to take up and examine (or employ some competent person to examine) the great and immediately important question: Do the elements of successful iron-manufacture—suitable ores, fluxes and fuel—exist on the line of the Union Pacific Railroad?

Pumping Engines.

UNDER the heading "Pumping Machinery," a technical cotemporary publishes some statements which, if true, are calculated to overthrow all the computations regarding pumping machinery which have heretofore been made, and also all the recognized standards which have been adopted as the basis of computations of the power of engines.

A committee of the Franklin Institute but recently made a report on the actual horse-power of engines and boilers, the substance of which was published in our columns. It is unfortunate either that they were unacquainted with the engineering geniuses of our city, or that the latter gentlemen did not inform themselves of the result of the investigations of the former body, by referring to the ENGINEERING AND MINING JOURNAL. The article on pumping machinery to which we refer begins with a well-merited tribute to the efficiency and economy of the Cornish engine. The only objection made to this engine was that the first cost was too great for our country. So thoroughly do we endorse their introduction, that we reproduce it entire.

"Probably no example of mechanism more nearly approaches perfection than does the Cornish pumping engine. The talents of three generations of engineers have been devoted to its improvement, and the industries of a great nation have been indirectly dependent upon its work. Operating with greater economy of coal than standard engines of other classes, and employed in mines long established and belonging to wealthy owners, its great first cost can scarcely be called a serious objection among English mine-owners, and hence its general employment for pumping purposes in the old country.

Following this, comes a description of the particular pumping machine, and some "spread-eagle" talk about developing the mineral wealth of the country by American machinery. Then comes a very astonishing statement. They say that by means of this pump, and a twenty horse-power engine to supply the power, fourteen thousand gallons of water were lifted eight feet high in one minute. This either means that not more than twenty horse-power were necessary to accomplish the work by the use of the improved machinery, or it means nothing. We have no reason to doubt the fact that fourteen thousand gallons were raised to the designated height; but let us see about the power.

The utmost demand that can possibly be made of a pump is that it shall utilize all the power furnished by the the prime mover, but never that it shall generate power. Now let us examine more closely the statement of our cotemporary. A gallon of water, at the ordinary temperature, weighs a trifle over ten pounds, and hence 14,000 gallons weigh a little more than 140,000 pounds. According to the definition of a foot-pound, we shall require, to raise this amount of water eight feet high, 1,120,000 foot-pounds per minute, or about thirty-four horse-power. In other words, an engine of twenty horse-power is so much assisted by the valuable pump in question, that it can actually furnish thirty-four horse-power. "*Qui prouve trop ne prouve rien.*"

Of course, every one of good common sense knows that the pump never could have accomplished what is claimed for it. If, however, the answer should be made, "Everybody knows that a twenty horse-power engine may actually perform more than that amount of work," we should reply—in true Yankee style—"How can you judge of the economy of a machine if you only know how much work it can do, but don't know how much power it requires to perform it?"

We are all prepared to pardon such nonsense in non-professional papers, but it really seems time that the technical papers of this country should give a little more attention to the scientific analysis of their editorials.

Colorado Mines.

WE are glad to learn that the product of the precious metals in Colorado promises to be greater this year than for any preceding year, unless we must except some of the early seasons of flush gulch mining—concerning which, however, the figures are not particularly authentic or exact.

In Gilpin county the usual activity is maintained; and the production kept up, in spite of the continued idleness of some of the best mines. In Boulder county, the Caribou and a few other mines are producing largely and regularly. In Clear Creek county, all the leading mines seem to be in good condition, and there is, besides, an unusual amount of individual mining, by private parties who find ready sale at the works of STEWART, or PALMER and NICHOLS, for lots of ore from ten pounds upward. This small industry adds a good deal to the general aggregate of production; and, although it has no element of permanence, it frequently leads to the development of rich mines. In a word, it is self-sustaining prospecting; and, though it is really a robbing of the richer ores at the most accessible points, yet it does but little harm in this way, since it is principally confined to the neighborhood of the surface; and it may do great good, in sustaining the general prosperity of the community, and in revealing more minutely and widely the extent of its mineral wealth.

MINING SUMMARY.

California.

A dispatch to the New York Associated Press, dated San Francisco, July 25, says: The Miners' League has begun a reign of terror in Amador county. Gangs of men, wearing masks, were about last night searching for the officers of the different mining companies, with intent to murder them. The officers of Amador county and a force of men not beloning to the League are now besieged, but they are determined to hold out to the utmost. E. E. HATCH, the bookkeeper of the Amador mine, was assassinated by the Leaguers, but before he fell he succeded in shooting one MCMENOMY, a leader of the Leaguers. The extent of the trouble is unknown, as communication with the operators is difficult, in consequence of the proceedings of members of the League. Troops will be ordered to the scene of the disturbances from different points immediately.

From the *Alta California*, July 12th: The Chollar mine since its commencement has produced, it appears, $10,058,573, of which nearly one-half was paid for working the ores, and the stockholders have received, in money, $2,831,875, but they have paid in assessments, the last one February, 1868, $462,000, making, net, $2,369,875, on 2,800 feet, or $846 per foot in five years. The present price of stock is $500 per foot, consequently the dividends have been $11 75 per foot per month for the whole period. The present dividends of $2 per share, or 4 per cent. per month, are the average earnings of the mine since its organization, and while the ore has varied from $13 15 to $41 30 per ton, the average has been $28. The expenses have been reduced as follows: In 1867 $15 was paid for milling, at present $12; mining the ore cost in 1867 $4 68, and this year $3 95. That has certainly not been a bad property. But it is a curious fact that its stock has ruled less in market in proportion to its real value than that of any other mine.

GLOBE.

From the Alpine *Miner* July 15th: At this mine the work of sinking on the copper vein was commenced early this week. Like the deposit in the Leviathan, this ore does not rise above top of the tunnel, but widens out below. One shift took out two tons yesterday, said to be worth $60 per ton on the dump. The ore now found in the Globe mine is the same kind as that in the Merrimack, opened only slightly, two or three years ago. Since it is known to be a very valuable ore, netting a better profit than any other kind now found here, it would seem to be sound policy on the part of the owners of the Merrimac to either purchase the Winchester tunnel property, or obtain the right of way through it, and open their gray copper lode by continuing it thereto. From one to three hundred feet of tunnel beyond the present face of the Winchester tunnel would, it is believed, open up a fine paying property.

TARSHISH.

The last strike in the Tarshish lode by the Schenectady Company, shows a better class of ore than any before found; proving the old theory in regard to this lode, that the deeper it was opened the clearer of base metal the ore would be. This strike is in a lower level than any before made.

MINING SITUATION.

From the Grass Valley *Union*, July 16th, we take the following: The mining business in the vicinity of Grass Valley is in as flourishing condition, taking all things into consideration, as at any time in the past. Prospecting is very active in quartz and in gravel mining, and prospectors are succeeding well. The custom-mills are kept running most of the time, and the Superintendents of these mills inform us that the rock put through is unusually rich. We have only space, this morning, for the mention of a limited number of mines.

THE IDAHO,

on the Eureka ledge, east of and adjoining the Eureka mine, is doing well. The yield of the Idaho mill and mine, with fifteen stamps, constantly running, is about $1,000 worth of gold for every 24 hours. This yield has been constant and almost unvarying for a year past. The Idaho is to have a new working shaft and more stamps in the mill at as early a day as practicable. The new shaft, the additional stamps and other improvements, will probably cost the company in the neighborhood of $100,000. This fact demonstrates the value a mine has as an industrial resource or as an employer of men. The stock of the Idaho is owned principally in Grass Valley, and owners of the stock seem in no disposition to let any of it go into the market.

THE EMPIRE

mill is not running at present. The mine is being worked, however, with all diligence, the miners being engaged in sinking and developing the ledge.

NORTH STAR

mine is running regularly in all its departments, and is paying very well. The profits of the North Star, by the month, for the last year, have been about $9,000. Regular dividends have been made by the Company at San Francisco. The North Star's present condition is very excellent. We observe that Superintendent Hoyt is getting a full supply of wood, for the next winter's run, under the sheds at the mill.

SOUTH STAR

mine is being opened in a systematic way. This mine is located southwest from Grass Valley, and though the location is not a new one, the work of making a mine out of the South Star Quartz ledge is recent. The shaft of the South Star is down 230 feet, and is vertical. At this depth a drift has been run toward the South eighty feet, and to the North fifty feet. The miners are now "raising up" in order to stope out the ledge. On the dump pile there are about 150 tons of rock. The South Star ledge stands at a perpendicular, and is fully three feet in thickness. It is one of the finest looking ledges in Grass Valley District. The company have an engine of 12-inch cylinder, which does the pumping, and another engine of 10-inch cylinder which does the hoisting, Work is being pushed with all energy.

NEW YORK HILL

mine, after being idle for two years or more, is again being worked. The water is already being pumped from the shaft to the depth of 500 feet, and in about four weeks ore will be coming out of the mine. The company working the New York Hill mine is a strong one. The history of this mine shows its value. The claims now belonging to the New York Hill Mining Company were first worked in 1852. Almost $1,000,000 worth of gold has been taken from these claims from first to last. Some of the parties who worked the claims at an early day did so with great profits. The last company which worked the New York Hill ledge, took out a large quantity of gold, but did not make a profit on their work. It is now thought, and with good reason, that if the New York Hill mine is carefully worked, having economy and faithful labor always on guard while it is being worked, large profits will result to the owners of the mine. The sulphurets carried by the New York Hill ledge are remarkable as being very rich, seldom running less than $100 to the ton, and sometimes yielding $220 to the ton by chlorination process. This new opening of the New York Hill mine will be watched with great interest by the miners of Grass Valley. The machinery and all the works in the mine are in fine condition. To show that our estimate of the former yield of the New York Hill mine is not excessive, we give the figures from the books kept during the working of the mine. For convenience we put down round numbers at less than the actual numbers. While LARIMER & Co. owned this mine they took out $200,000; JOE WILDE took $150,000; FRICOT & Co. took out $300,000; SYKES & Co. $50,000, and the New York Hill Mining Company, under whose administration work was stopped, took out $206,000, a total of $906,000. The ledge, when the mine stopped, was strong, and showed the same characteristics as it did in former days.

OTHER MINES

are doing well. Perrin's shows rich rock, with an improving ledge. The Grant mine is proving very rich. The Grant mine is the extreme southern mine of the Grass Valley district. The Seven-Thirty is sending out more of that $200 to the ton ore which has made the mine famous. In

GRAVEL MINES

much good and paying work is being done. The Webster company have a rich deposit of gravel, and successful work is being done. Town Talk is working with splendid results. The mill of the Town Talk is now being run by steam power, and the scarcity of water will not prevent constant work. The Altona has a large and rich body of gravel as far as explorations have been made. Alta No. 3 is getting up a steam mill to crush their gravel. The situation of the Grass Valley mines is most encouraging.

Colorado.

CLEAR CREEK COUNTY—DEMOCRAT MOUNTAIN.

From the Colorado *Register*, July 19th:—The heavy growth of timber on this mountain has been charred by the late fires that have swept through it. Most of the miners' cabins are also destroyed. All the excitement that prevailed two years ago, when the Brother Jonathan, Green City and other lodes occupied the attention of the people and the courts, has subsided, and only a few lodes are now being worked. Messrs. DARRAGH & PARKER are mining on the New Boston. This lode is well-known to be the largest vein of ore yet discovered in this county, the vein matter being zinc-blende, iron pyrites, and galena. In one place in the mine it is six feet in width in streaks separated by crevice matter containing some mineral. The lode has been stripped several hundred feet, showing ore nearly all the way. A shaft about 180 feet is connected by a tunnel about 200 feet long. The surface improvements are a log shaft-house and boarding house, which both escaped the ravages of the late fire. The Muscovite lode, higher up the mountain, in its general characteristics, so far as developed, resembles the New Boston. The cabin owned by this company has also escaped, although the trees are burned within fifty feet of it. The Henry Ward Beecher lode, still higher up the mountain, has been extensively worked. A company was formed on this lode by Father CREE. The new company have decided to wait the completion of a railroad to Georgetown before resuming mining operations. The Amazon lode is another showing a large, strong mineral vein. The ore occurs only in pockets through the quartz as yet. The improvements made by HARRY LAMPSHIRE consist of two tunnels from 80 to 90 feet long, and a drift on the vein about 100 feet. The ore is zinc-blende and galena.. A government patent has been applied for on this lode recently by Mr. OLD. This is the fiftieth final survey made in Clear Creek county in the past two years. Mining is to be resumed on this lode as soon as a patent shall be obtained. So says Mr. OLD. HENRY ADAMS, a successful prospector, has discovered a rich silver lode on the Bard Creek slope of the mountain, and named it in honor of MATILDA FLETCHER, the Iowa poetess, the "Fletcher Lode." HENRY has specimens of silver glance and brittle silver, which he has taken out of it near the surface.

MILL CITY.

The work of development goes on in the mines about here. Prospecting is pretty much suspended. The present work is being done in old and well-known lodes. CYPHER & LARSON are running a tunnel into the Commonwealth lode. It is now 60 feet in, and 20 feet in the crevice. The Commonwealth is a large galena vein, and promises to be a first-class lode. The Capital lode, near the Commonwealth, in Ohio gulch, worked by Mr. CARPENTER for a Louisville company, looks well. Nine miners are employed in it. A whim is used in hoisting, and the late developments prove satisfactory. We noticed specimens of native silver taken out this week. The Mohawk lode, owned by Justice DUBOIS, in the same vicinity, produces a large amount of amalgamating ore. Some of it is being hauled to PALMER & NICHOLS, Georgetown, for treatment. The Wild Wagoner lode, up Mill creek, is receiving some attention. Six miners are employed developing its resources. The vein is 25 feet between walls. The owners expect something big when depth shall be obtained.

From the Colorado *Miner*:—The shipment of bullion during the past week from the International Mill, Argentine, have been two bricks, one weighing 1119 ozs., 763 fine, $1109 30 coin value, and one weighing 1060 ozs., 804 fine, $1112 coin value. Total value for the week $2221 80 coin. The above was obtained from Bellmont ore.

We are informed by GEORGE L. SITES that work has commenced on the Nyanza and Crescent lodes, situated on Democrat Mountain. We are truly glad that this property is about to be developed, as the lodes have every appearance of ranking among the best in Gr ffith Mining District.

KENNEDY & REYNOLDS are working the main lode, and are obtaining remarkable results. The owners have realized at the rate of from $15 to $20 a day. They are now sinking and drifting, and the mineral in the vein is improving in appearance. The first class ore taken from this mine yields by mill treatment 719 ozs., and the second class, by the same method, 272½ ozs., per ton.

Nevada.

From the Reese River *Reveille*, July 12th: The most important purchase of mining property ever effected in this district, was made by the Manhattan S. M. Company, of Nevada, on Saturday last. The property was bought at Sheriff's sale, and was sold as the property of the Reese River Consolidated Company to satisfy a judgment in favor of E. S. DAVIS, Receiver of the First National Bank of Nevada. It went for $60,000 in currency, and is dirt cheap, for it comprises about forty different and distinct locations, all of them made during the first months after the discovery of the Reese River country. Among the list, which will be published below, will be recognized the names of several mines of reputation, on which extensive developments have been made, such a

the Whitlach Yankee Blade, Whitlach Union, Savage, Wall and Isabella, etc. The Reese River Consolidated Company had been organized by JOHN W. HARKER, who had negotiated the sale of the various mines which composed the property of this company, in the East—Boston, we believe. Some of these mines were sold by Mr. HARKER for more than the whole batch has now brought. The history of how the property of this company became mixed up in the affairs of the defunct First National Bank of Nevada (also established by HARKER) is one which we have not the space to give; nor does it matter here. By this purchase the Manhattan Company come in possession of mines which insure the permanency of that concern. The youngest child in the State, if he lives the time usually alloted to man, will see in his old age the Manhattan Company far more powerful than it now is. Our citizens have reason to congratulate themselves on this transaction, for it places valuable mines in the hands of live men, who understand the nature of the formation in which they lie; know its faults as well as its advantages, and will steer clear of the blunders and follies which ruined their former owners, and brought discredit on our section. Following is the list of mines enumerated in the deed: The Apollo ledge; Blue ledge; Black ledge; Camargo; Congress Independent; Jo Lane; Eclipse; Whitlatch Yankee Blade; Wall and Isabella; Beard and Seaver, original location; Beard and Seaver (both on Union Hill); Hornet; Erie ledge, two locations, 1,200 feet each; Chicago; Harker; Honest Miner; Union No. 2, first southerly extension; Union No. 2, first northerly extension; Yosemite; Silver Cloud; Governor Seymour; Isabella; Wall ledge; Monitor ledge; Nevada ledge; Pearless ledge; North Star, second extension west: Gale & Beckwith Company; Yosemite ledge; Jefferson ledge, Pleasant Company, first S. E. location; Jefferson ledge, Madison Company, first location, N. W.; Jefferson ledge; Madison ledge; Sally Davis ledge; Oregon ledge, Wall Company, first westerly extension; Oregon ledge, second westerly extension; Southern Light ledge, first westerly extension; Diana ledge; Eclipse ledge, first northerly extension; Pride of the East ledge; Savage ledge; Consolidated Union Tunnel.

The Nevada *Transcript* says that work has been resumed on the Nevada mine commonly known as the Old Fogy's mine.

SILVER BARS.

From the Pioche *Record*, July 13th: We saw fourteen silver bars at JOHN CAHILL'S assay office on Monday, eleven of which weighed 160 pounds each, and nearly all over 800 fine. One particularly fine bar from the Raymond & Ely mines, containing $2,446 07 in silver, and $218 29 in gold, making its total value $2,664 29. This is considerably ahead of any bar yet run in the District, in value. There is plenty of material in this isolated District to produce bars innumerable like the one just mentioned, and with the mills to reduce a reasonable amount of the ore that can be extracted, such bars would be almost too common to make a note of.

From the Humboldt *Register* of June 17th, we learn that the amount of bullion shipped from the Arizona mine, through WELLS, FARGO & Co., was $7,818 50.

RELIEF DISTRICT.

The Batavia and Pacific District are down eighty feet, and have 1,500 tons of fine ore on dump. They are putting up a five-stamp mill, which will probably be running by July 15th. A roasting furnace will be added.

RAILROAD DISTRICT.

The Elko *Independent* of June 17th says: The ledge in the Rising Sun mine is ten feet wide, and works $150 per ton. It belongs to Mr. Houghtaling. The Lyon, belonging to MORGAN & PEYTON, works $100, and has six narrow streaks, an inch or two thick, that will essay $300.

REESE RIVER—THE SITUATION.

The *Reveille* of June 21st says: Mining has been going on in Austin since the spring of 1863, and the prospects of the district have never been more flattering than to-day. The best proof of this is that not one of the cabins in the edge of the town is empty. Two years ago a new comer could step in and take possession of deserted lodgings almost anywhere.

SHUT DOWN.—Same of 24th says: The Manhattan Co. mill is closed to enable the workmen to erect the amalgamating machinery. The force at work is as large as can be crowded in the building. The addition will increase the capacity to thirty tons per day. The steam works on the Oregon shaft are being taken out and heavier ones put in. The new pump is one of the largest in this State outside of Virginia and Gold Hill.

WASHOE ITEMS.—The Gold Hill *News* of June 20th says: The Yellow Jacket is yielding 175 tons of ore per day from the 800, 900 and 1,000-foot levels, milling $40 per ton. During the past week 220 tons of ore were taken from the Overman, assaying $17 per ton. The principal yield is from the 226-foot level. The Caledonia yields ninety tons per day, keeping two mills running. The ore section is from the 300-foot level up. The Segregated Belcher is not yielding much ore. The sinking deeper of the Ophir shaft progresses, with no serious impediment from water, and it is estimated that it will take seven months to sink to the contemplated depth of 1,400 feet. On the 14th inst., $22,975 was sent down from the Crown Point mine, and $31,689 from the Chollar-Potosi. SAVAGE is yielding 175 tons of ore per day, and HALE & NORCROSS about the same.

BORAX CRYSTALS IN NEVADA.—The Yolo *Mail* of June 17th says: "We were shown the other day a box of borax crystals from the claim of our townsmen, WM. TROUP and J. V. LEWIS, situated about forty miles south of Wadsworth, Nevada. The borax discovery was made by Mr. TROUP some time ago, and now in company with Mr. LEWIS, he has located 1,280 acres of land, every acre of which they estimate will yield forty tons of the crude material, or about eighteen tons of pure borax, which is worth about $400 per ton. The sample we saw had been worked in San Francisco, where there are refining works, but we learn the company intend erecting reduction works on their claim at once, which will save largely in the item of transportation; a fact of which many may not be aware, and which makes a borax mine exceedingly valuable, is that the ground reproduces crop after crop, and hence the claim of Messrs. TROUP & LEWIS is more valuable than a gold mine."

QUICKSILVER.

The Watsonville *Pajaronian* says: F. G. ROBBINS, of this place, has lately discovered, near the Mariposa Peak, Pacheco range, Monterey county, forty miles from this place, a rich lead of cinnabar.

Montana.

From the Rocky Mountain *Gazette*.

HENDERSON GULCH.

Each year, as time passes, noticeable changes are to be seen, and claims which were remunerative to their owners a year or two ago, are now deserted. Many have sought new fields of enterprise, and those placers in which they toiled for gold will see them no more; but with all the changes that have taken place, one fact is evident, and that is the prosperous condition of this camp, which still continues to yield equally as well as it did last year. With an abundance of water on hand, this camp is liable to continue to "pan out" for several years to come. Mr. WALMOUTH recently paid $1,200 for a one-fourth interest in the bed-rock flume at the lower end of the gulch, and a claim on Elk Bar (CONNER & Co.,) cleaned up $1,500 a few days ago, from twelve days run on their ground. The population of the camp consists of about forty Whites and fifty Chinamen, the latter being in the preponderance.

ELK CREEK.

The mines here are now in better shape than ever before. MIDDAUGH & JONES, lower claim on the gulch, took out this spring from $15 to $20 to the hand per day; KINTZ & Co. next above, and CROGAN & Co. average from $800 to $1,000 per week; STONE & Co. are doing well with two years work ahead. DOOLEY & BROGAN bought out JAMES DUGAN'S bed-rock flume of 3,000 feet, three weeks ago, for $3,500. This company has been offered $24,000 for their ground in Elk by Chinamen. GRANT, MCGOVERN & HIGHLAND are taking out good pay; J. D. CRAM'S ground is paying $9 per day to the hand.

JEFFERSON GULCH.

The Puhl boys own the lower ground, and are now engaged in putting in a new bed-rock flume. They have been offered $5,000 for their mines. HARRIS & BROS. take out $50 per day to the hand. RICHARDS' high bar is not paying at present. The Lone Man lode at the head of Jefferson has about eighty tons of rich rock in sight, but there being no mill near it, it is impossible to test its richness. Capital is needed to develop this rich mine.

FREDRICKSON.

From the *New North West*, July 15:—It is fair to say that the Fredrickson camp has not developed yet as well as anticipated. Prospecting still continues, and the boys have good encouragement by the reduction of water by the Miners' Ditch from 25 to 12½ cents per inch. The old mines in Dry and Prairie Gulches are turning out well. NEWELL & Co. on Dry Gulch cleaned up $700 on Sunday from three days' run, and will hereafter clean up from $700 to $1000 every three days. On Dry Gulch, LEVERIDGE & GILLIS cleaned up $800 for a ten days' run with four men, and the other companies were all doing well as long as they had water from the Upper Ditch. The very fact, however, of their having mines that are good enough to wait with, prevents the concession that would result in turning in the water again, and so we anticipate the ground will be laid over until '72. Water has been shut off in the Upper Race Track Ditch. It covers good mines in Dry Gulch, and water cannot be had from other sources, and has been carrying about 500 inches. It appears the scrip of the Ditch has been bought up at low figures by claim owners, and they think they should have water on it without paying any cash. The Ditch owners ask them to pay half cash and half scrip. This they have not seen proper to do. The result is that the water is turned out. There is a good deal can be said on both sides of the case, but saying things won't turn the water in, and that's what is to be regretted.

British Columbia.

QUESNELL.

From the San Francisco *Chronicle*:—Quesnell is situated upon the banks of Frazer river, and distant from Cariboo, 60 miles. From Quesnell to Moore's Landing, on Stuart's lake, near Fort James, is 170 miles by trail. The route is destitute of roads and bridges. We were twenty-three days getting there through from Quesnell. Had trails and swamps and marshes to cross, and rapid creeks and rivers to retard our progress. At present this is the most practicable route to get supplies to the mines. To Tatlah Landing from Fort James—distance, 150 miles—through a chain of lakes and rivers; made the trip in four days in a canoe; arrived there June 4. Distance by land to Hogem (appropriately named), on the Omineca river, 50 miles; down the Omineca to Germansen creek, 60 miles; total distance from Victoria, 940 miles. The high state of water in the creek will not admit of prospecting its bed, and much less working it successfully at present. Hundreds of miners are there doing nothing. During the months of May, June and July, it would require a flume twenty-five feet wide and five feet deep, and upon a good grade to carry the water. A practical miner can readily understand the difficulties and expense to handle so large a body. The claims will have to be worked in precisely the same manner as those river diggings in California. Expensive wing-dams and pumps will not be required. Mining operations will not commence briskly until August, and the last of October King Frost stops further mining in the camp. The extreme shortness of the mining season, and the great difficulty in getting supplies to the mines, make it a very unprofitable field for a miner to emigrate to. Claims that will yield no more than $10 per day to the hand are not worth working. An ounce a day will be required to justify a miner in devoting his time to mining in that region. A reported strike was made early this spring, and 300 ounces are said to have been taken out. It was found near the surface, and upon a stratum of sand. Other parties located claims adjoining, above and below this, and at once commenced prospecting. The result was not satisfactory. The same deposit of sand was found, but no gold. On June 13th there were nearly 800 men in the mines, and more arriving daily. Many are without means, and have to resort, as a means of obtaining a living, to packing heavy loads of freight upon their backs from Tatlah to the Omineca river, a distance of fifty miles, for the sum of twenty-five cents per pound. No work to be obtained in the mines, and they were compelled to compete with pack animals. Many Chinamen are on the creek, and they already hold 1500 feet of mining claims. Accounts of rich discoveries being made in outside creeks are published and copied into the California papers, thereby doing a great wrong to our own citizens, causing them to leave their homes and come here to search for mines that do not exist. In every instance where they have reported such discoveries, outside of Germansen creek, I have found by personal examination to be untrue.

New Mexico.

Cimarron *News*, July 8th.

RICH YIELD.

The Maxwell Land Grant and Railway Company's receipts from their gold placer mines amount to the nice sum for this week of 477 oz. 18 dwts. and 5 grs.

The Cornish miners, recently brought to our Territory by the Maxwell Land Grant and Railway Company, are engaged at the Montezuma mine, but their labors are at present, we understand, more of an exploring character, and are likely to lead to some rich and important mineral discoveries. The lump of native silver, weighing 19 pounds, found by CHARLES MCINTOSH in the Rosario mine, Lone Mountain, of which mention has been made in this paper, has been sent to Las Cruces, and from

there will be forwarded to the Missouri State Fair, to be held in St. Louis, as a specimen of the silver ore of Southern New Mexico. Its estimated value is $131.

THE *Iron World and Manufacturer*, published at Pittsburg, Pennsylvania, contains a large amount of matter valuable to those interested in the metal trades. We understand that they have made important additions to their editorial staff, and have redoubled their exertions to make their paper the recognized standard organ of the metal trades. The iron industry, which within a few years will without doubt be developed around Pittsburg, will bring them in the very centre of the largest iron-producing district in the country, and this fact, added to the present influence of the *Iron World*, will, without doubt, place it at the head of the papers devoted to the iron trade in this country.

PROPOSALS.

DEPARTMENT OF PUBLIC WORKS, NO. 237 BROADWAY.

To Contractors:—Proposals inclosed in a sealed envelope, with the title of the work and the name of the bidder indorsed thereon (ALSO THE NUMBER OF THE WORK AS IN THE ADVERTISEMENT) will be received at this office until Monday, August 7, 1871, at 11 o'clock, A.M., for the following work:

1. For paving Willett street, between Rivington and Houston streets, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

2. For paving Nineteenth street, between Second avenue and East River, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

3. For paving Twentieth street, between Sixth and Tenth avenues, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

4. For paving Twenty-second street, between Eleventh avenue and Hudson River, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

5. For paving Thirty-third street, between Lexington avenue and East River, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

6. For paving Seventieth street, between Fourth and Fifth avenues, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

7. For paving Eighty-fourth street, between Third avenue and Avenue A, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

8. For paving Tenth avenue, between Fourteenth and Sixtieth streets, with Belgian pavement, and laying crosswalks at the intersecting streets where required.

9. For paving South Fifth avenue with Guidel improved stone pavement and laying granite crosswalks at the intersecting streets, where required.

10. For sewer in Seventeenth street, between Ninth and Tenth avenues.

11. For sewer in Church street, between Canal and Lispenard streets.

12. For sewers in Avenue D, Thirteenth and Fourteenth streets, and Thirteenth street, between Avenues C and D.

13. For sewer in Fifth avenue, between Thirty-fifth and Thirty-sixth streets.

14. For sewer in Fifty-sixth street, between Sixth and Seventh avenues.

15. For underground drains between Ninety-first and Ninety-third streets, and between Second and Third avenues.

16. For regulating, grading, curb, gutter and flagging Forty-fourth street, between First avenue and East river.

17. For regulating, grading, curb, gutter and flagging One Hundred and Twenty-sixth street, from Second to Eighth avenue.

18. For regulating, grading, curb, gutter, and flagging One Hundred and Forty-seventh street, from Avenue St. Nicholas to Twelfth avenue.

19. For regulating, grading, curb, and gutter Avenue A from Sixty-first street to Eighty-sixth street.

20. For regulating and grading Sixty-seventh street, from Fourth to Fifth avenue.

21. For curb, gutter and flagging Fifty-first street, between Second avenue and East river.

Blank forms of proposals, the specifications and agreements, the proper envelopes in which to enclose the bids, and any further information desired, can be obtained on application to the Contract Clerk at his office.

WILLIAM M. TWEED,
Commissioner of Public Works.

New York, July 26, 1871.

STANDARD CLAY RETORTS,

FIRE BRICKS AND TILES,
STOVE LININGS AND FIRE CEMENTS.
Vitrified steam-pressed Drain and Sewer Pipe, and Manufacturers of Clay in general.
Baltimore Retort and Fire-Brick Works.
GEO. C. HICKS & CO,
Apr4:eow:1y Baltimore, Md.

$25. STEAM JET PUMP. $25.

The simplest and cheapest device ever known for raising water, oils, syrups, acids, &c. Capacity 40 gallons per minute. Used in hotels, factories, mines, quarries, &c. Operated by steam direct from boiler. *Has no valve or wearing parts of any kind. Is unaffected by sand or grit.* Certain to work at all times. Sent to any address on receipt of $25. SINKER, DAVIS & CO., Indianapolis, Ind.

U. S. PATENT OFFICE,
WASHINGTON, D. C. June 26, 1871.

On the petition of J. D. WEST of East Orange, New Jersey, praying for the extension of a patent granted to him on the 29th day of September, 1857, for an improvement in pumps. It is ordered that the testimony in the case be closed on the 29th day of August next, that the time for filing arguments and the Examiner's report be limited to the 8th day of September next, and that said petition be heard on the 13th day of September next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE,
WASHINGTON, D. C. July 15, 1871

On the petition of DELOS W. GITCHELL of Newburgh, New York, and LUTHER W. BADGER of Elizabeth, New Jersey, praying for the extension of a patent granted to them on the 2?th day of October, 1857, for an improvement in manufacturing Seamless Felt Garments. It is ordered that the testimony in the case be closed on the 19th day of September next, that the time for filing arguments and the Examiner's report be limited to the 29th day of September next, and that said petition be heard on the 4th day of October next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE.
WASHINGTON, D. C. June 23, 1871.

On the petition of WILLIAM PLUMER of Boston, Mass., praying for the extension of a patent granted to him on the 5th day of October, 1857, for an improvement in Rock Cutting and Drilling Machines. It is ordered that the testimony in the case be closed on the 5th day of September next that the time for filing arguments and the Examiner's report be limited to the 15th day of September next, and that said petition be heard on the 20th day of September next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

EVERY USER OF STEAM POWER SHOULD HAVE
BELLIS' PATENT GOVERNOR,

It is the **CHEAPEST** and **BEST** Regulator for Steam Engines, known to mechanics.
We offer **SPECIAL INDUCEMENTS** to Engine Builders. ☞ Address for Circular and Price List, SINKER, DAVIS & CO., Indianapolis, Ind.
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Spring Mountain Lehigh Coal.
Extensively used for Smelting Iron.
☞ Rooms, 28 and 30 Trinity Building,
Ap6tf NEW YORK.

U. S. PATENT OFFICE,
WASHINGTON, D. C., May; 25, 1871.

On the petition of CHARLES H. SAYRE of Utica, New York praying for the extension of a patent granted to him on the 25th day of August, 1857, for an improvement in Cultivators.

It is ordered that the testimony in the case be closed on the 25th day of July next, that the time for filing arguments and the Examiner's report be limited to the 4th day of August next, and that said petition be heard on the 9th day of August next. Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE,
WASHINGTON, D. C., May 11, 1871.

On the petition of JOHN TOULMIN of Worcester, Mass., praying for the extension of a patent granted to him on the 25th day of August, 1857, for an improvement in Vibrating Shears.

It is ordered that the testimony in the case be closed on the 25th day of July next, that the time for filing aguments and the Examiner's report be limited to the 4th day of August next, and that said petition be heard on the 9th day of August next. Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

W. G. ATKINSON,
CIVIL AND MINING ENGINEER,
Charleston, Kanawha county, W. Va., P. O. Box 303.
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One hundred acres of land on B. & O. RR., one-half mile from Monrovia Depot and 48 miles from Baltimore, on which is a Magnetic Iron Ore and Copper Mine—width of vein 35 feet. Price ($125) one hundred & twenty-five dollars per acre, cash. Address, MRS. M. W. PLUMMER, Monrovia, B & O. RR.

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WHITE, FOWLER & SNOW,
Wilkesbarre and Lehigh Coal,
FOR STEAM AND FAMILY USE.
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Mines at Newburgh, Preston Co., W. Va.
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This Company offer their very superior Gas Coal at lowest market prices.
It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.
It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York, the Brooklyn and Citizens' Gas Light Companies of Brooklyn, N. Y., the Baltimore Gas Light Company of Baltimore, Md., and Providence Gas Light Company, Providence, R. I.
The best dry coals shipped, and the promptest attention given to orders. sep21-1y

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THE DESPARD COAL COMPANY OFFER THEIR Superior DESPARD COAL to Gas Light Companies throughout the country.
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☞ Reference to them is requested. may30-1y

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From Port Johnston and Jersey City,
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THE BEST IN THE MARKET.
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SEND FOR CIRCULAR AND PRICE LIST.
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MISCELLANEOUS.

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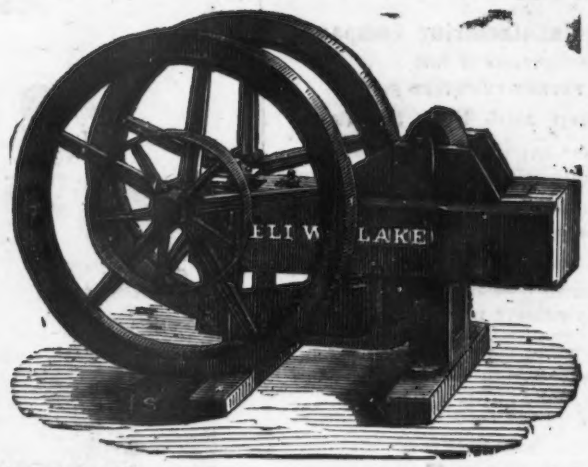

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This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

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May 17:1y

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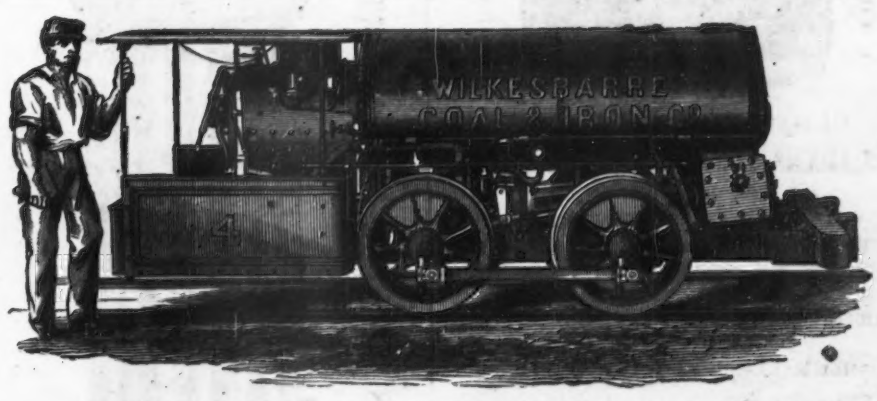
OXIDE OF ZINC, SPELTER, SHEET ZINC.

Jun28:1y **SPIEGELEISEN CINDER FOR BLAST FURNACES.**



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Materials and Workmanship Equal to those in Full Gauge Railroad Locomotives.

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Three Hundred and Forty Gross Tons of Cars and Load.

For Photograph and full particulars, address

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Feb:7:1y:eow

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Steam Pump Manufacturing Company,
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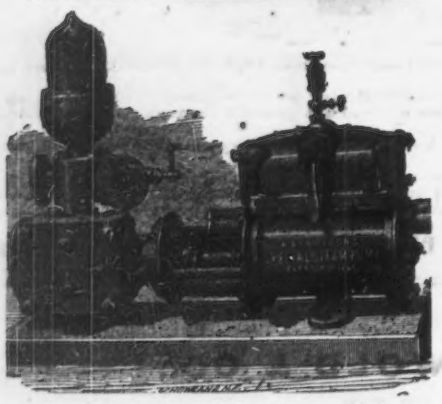

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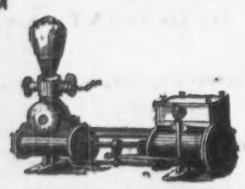

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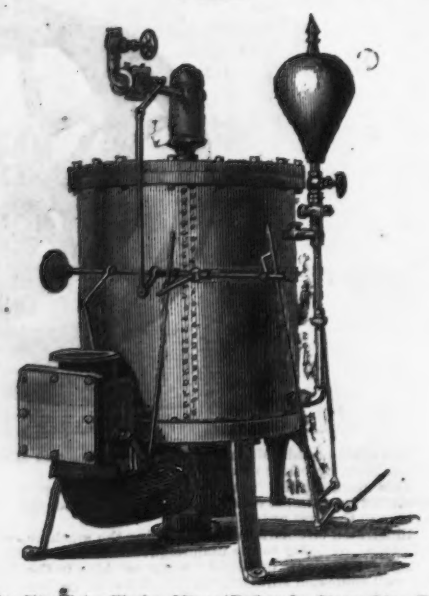

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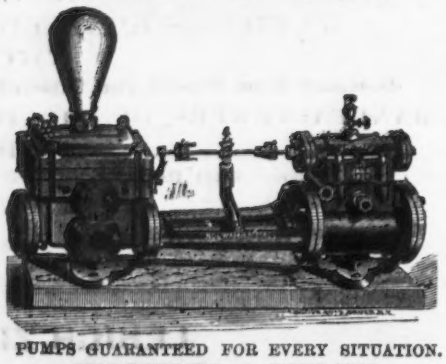

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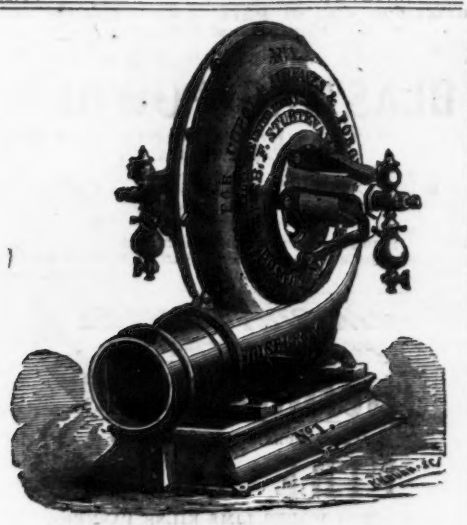

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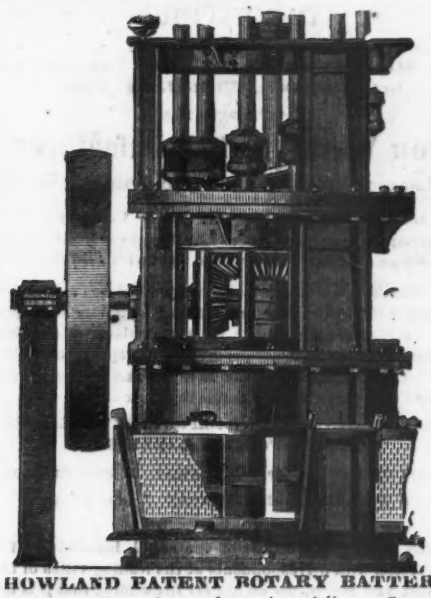

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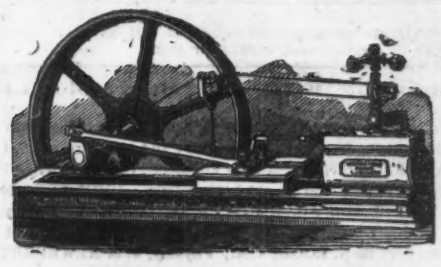

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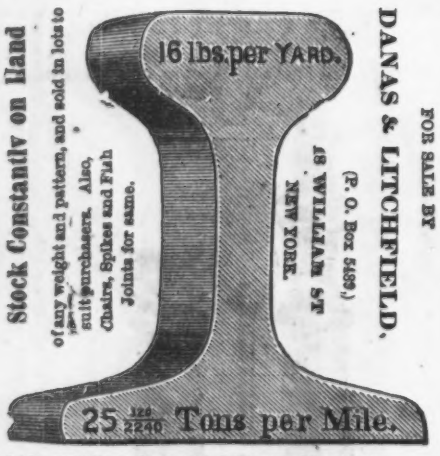
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